MAR. 20 1959

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

CRUDE RESERVES bounce back, reaching new peak of 30.5-billion bbl. 15

U.S. Total Up 235.5-million bbl.

La.	+186.4
Calif.	+106.7
Colo.	+ 82.1
N. M.	+ 62.4
Utah	+ 58.6
N. D.	+ 55.9
Miss.	+ 19.1
Mont.	+ 17.8
Ark.	+ 12.9
Neb.	+ 6.2
Ind.	+ 4.7
Ala.	+ 4.2
Ohio	+ 2.7
Misc.	+ 0.4

Declines Hit . . .

Texas	—232.9
Ill.	— 47.2
Okla.	— 43.4
Kan.	— 25.1
Ky.	— 11.7
Wyo.	— 11.0
Pa.	— 6.7
Mich.	— 4.5
N.Y.	— 1.7
W. Va.	— 0.4

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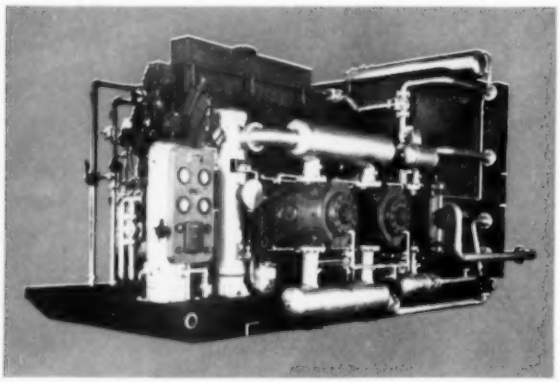
Price 50 Cents

STEVENS RICE G
UNIV MICROFILMS
313 NORTH 1 ST
ANN ARBOR MICH A C

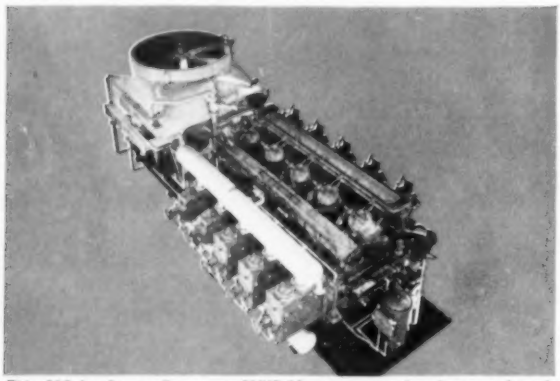
Southwest

DESIGNS, ENGINEERS, BUILDS AND INSTALLS PACKAGED COMPRESSOR PLANTS

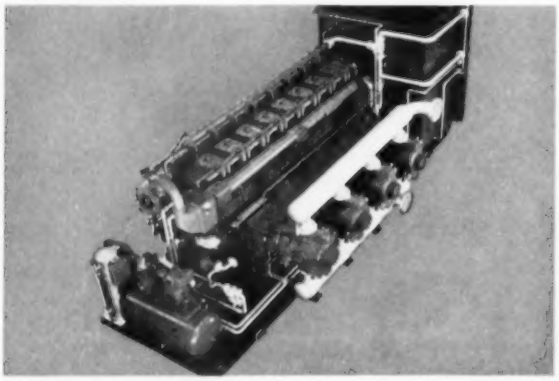
Using the Compressor You Select



A 330 hp Ingersoll-Rand SYG-6 compressor, packaged by Southwest Industries, is in gas lift service in the swamps of Louisiana.



This 660 hp Cooper-Bessemer GMXD-10 compressor has been packaged by Southwest for gas gathering service on an offshore platform in South Louisiana.



This 750 hp Worthington SLHC-8 compressor in a Southwest Packaged Plant is being used by a major gas company for pipeline boosting in East Texas.

Southwest Packaged Gas Engine-Driven Compressor Plants are complete, portable skid-mounted units for gas lift, gas booster, pressure maintenance, main line pumping, and similar projects. A Southwest Compressor Plant is a complete engineered unit, built right by men who know compressors.

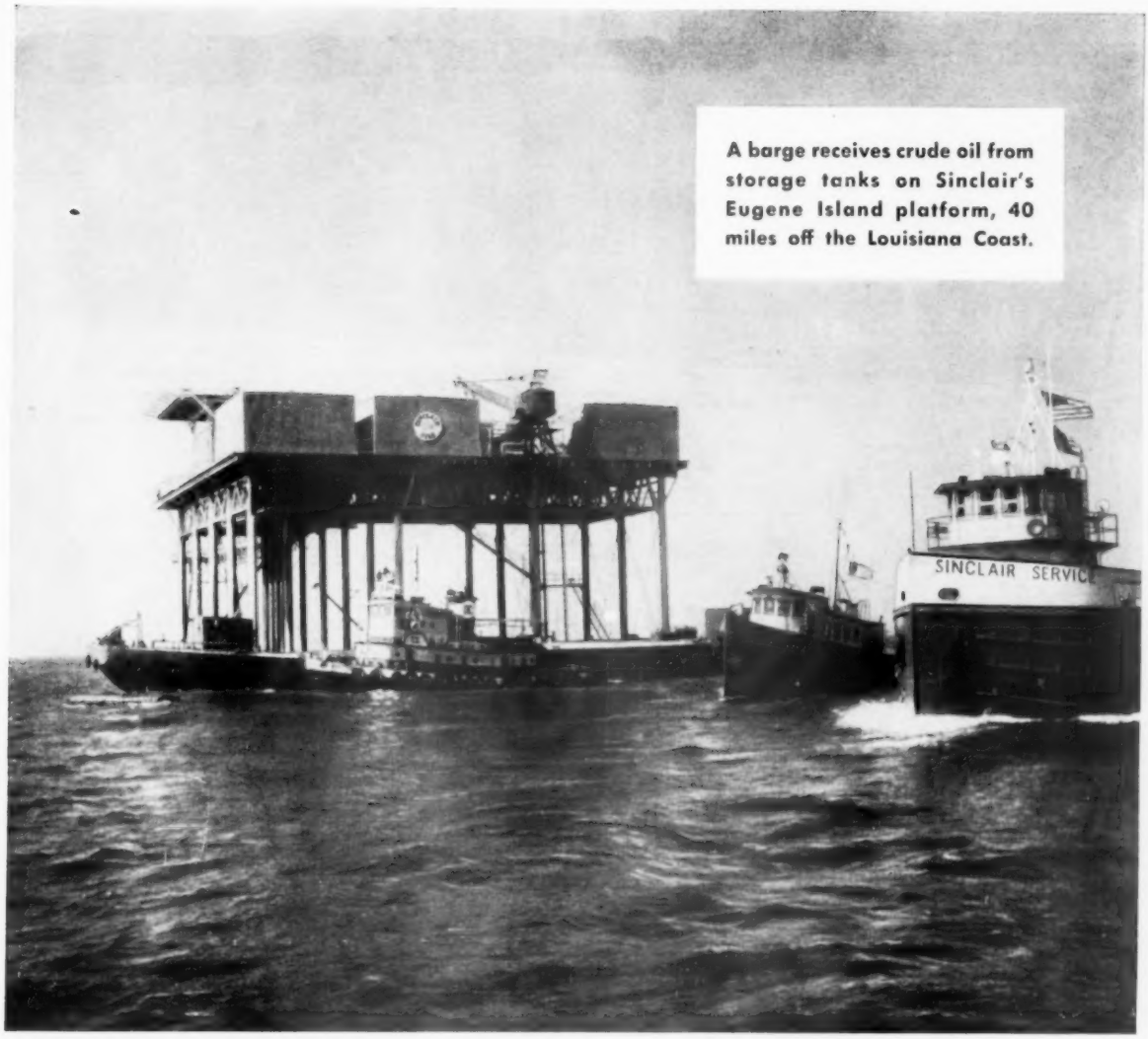
To the advantages of Southwest design and engineering, you can add flexibility by selecting your own make and type compressor in sizes from 25 to 2500 hp. Using the compressor of your choice, you do not need to re-train personnel or to increase spare parts inventory; yet, you can take full advantage of the vastly improved and superior design of the Southwest unit.

Southwest units installed in the field are now producing well over 110,000 horsepower — compressing almost 2 billion cubic feet of gas per day. Let a Southwest engineer explain the economics of packaged gas compressors to you.

SOUTHWEST INDUSTRIES, INC.

P. O. Box 19392, Houston 24, Texas

Designers and manufacturers of Packaged Inert Gas Generators, Packaged CO_2 Removal Units, Packaged Gas Compressors.



A barge receives crude oil from storage tanks on Sinclair's Eugene Island platform, 40 miles off the Louisiana Coast.

The Case of the Disappearing Derricks

Out in the Gulf of Mexico, some oil drilling derricks have disappeared. Offshore platforms look strangely bare. What's going on? Is the search for oil stopping in this promising area? Hardly. Actually, disappearing derricks mean that some of the promise is being realized; *oil has begun flowing to market.*

When the derrick comes down on a Sinclair Oil & Gas Company platform, it marks the transition from oil exploration to oil production. On three platforms which Sinclair operates for itself and three other companies, there now are a total of 10 oil wells in production and 4 gas wells shut in.

In relation to Sinclair's total crude oil output, *which reached a record high in 1958,* present production from 10 offshore wells is the proverbial drop in a bucket. But the start of production on this new oil frontier indicates that offshore oil will one day contribute importantly to the company's raw material supply and is another step forward in Sinclair's production expansion program.

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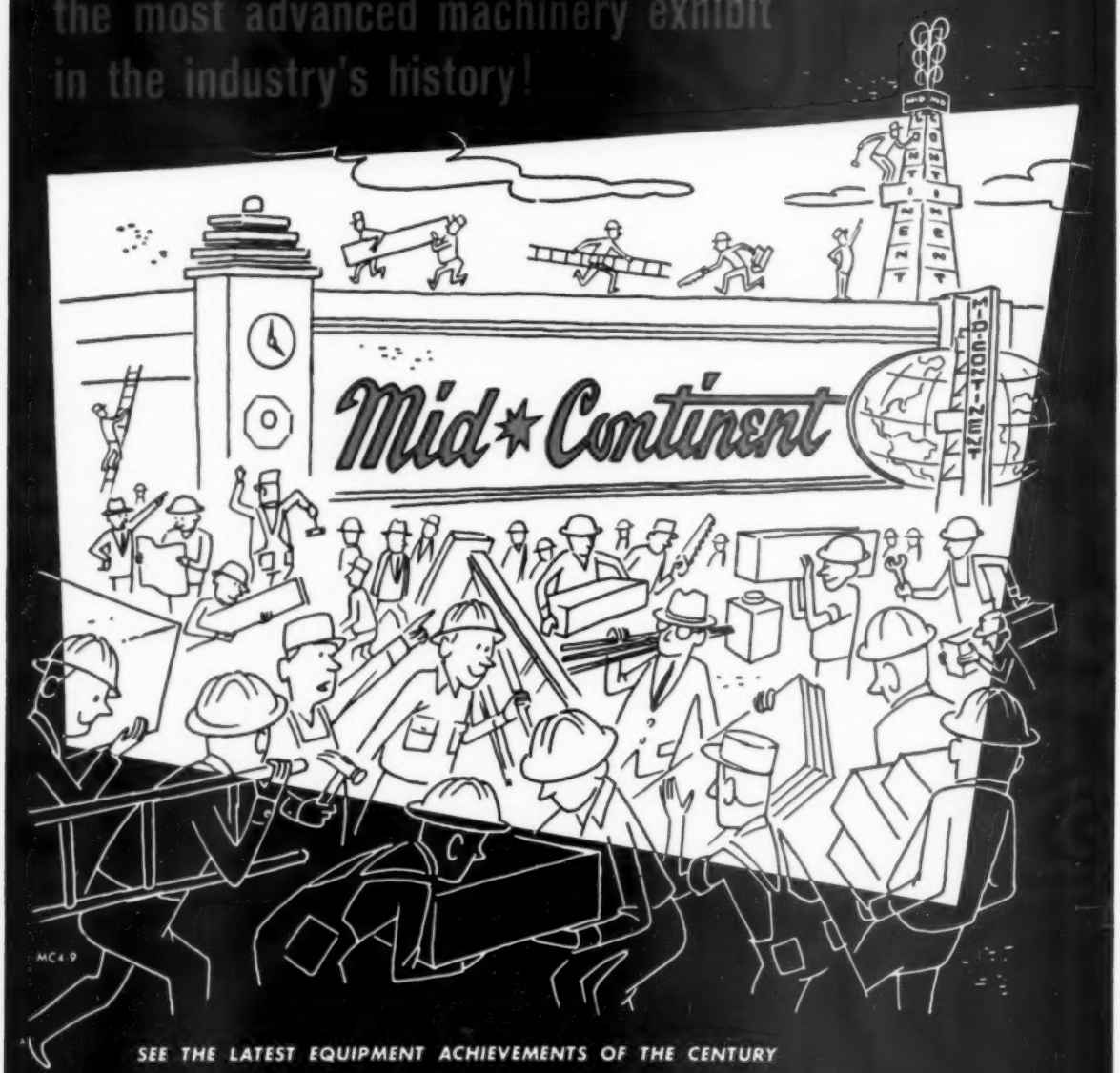

SEE THE LATEST EQUIPMENT ACHIEVEMENTS OF THE CENTURY

INTERNATIONAL PETROLEUM EXPOSITION

TULSA - MAY 14-23

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INSIDE Slant

SMILES COMING BACK AGAIN

There was a detectable feeling of optimism at the recent Southwestern district meeting of the API's production division, compared to the gathering last year.

Not an impression that a big boom is just around the corner, but a definite atmosphere of "things are getting a little better."

Last year, the talk among the supply, manufacturing, and service company representatives was of percentage losses in sales—this year, of slight gains.

A year ago, operating company personnel were discussing the cutbacks in drilling programs—this year, the increases.

One service company representative noted that his company was hiring again—"We got rid of the culls. Now, we're hiring good men."

Another noted his firm "had to push some items that had sold themselves for years," but that it now is experiencing an upturn in business.

But there was one ominous note that threaded its way through most of the conversations—the continuing cuts in crude prices.

These cuts have been fretting most of the segments of the industry, whether in the equipment or the producing end.

LeRoy Menzing
EDITOR

COST TO OPEN?
COST TO CLOSE?

The new Cameron Gate Valve will give you more trouble-free operating cycles for your money than any other valve on the market. When you buy a valve for water, oil, gas or mud service, you are paying for opening and closing cycles. But how many for how much? This is the question more and more buyers of these valves are asking.
Any approved valve will hold pressure when new and first installed in the line, but what happens afterward determines the actual cost. The easy-operating Cameron Gate Valve will perform more opening and closing cycles without repair because of its exclusive rotating seat design. The wear pattern changes and extends the life of this unusual valve each time it is operated. No continuous lubrication program is necessary to maintain a tight, leakproof seal. Finally, when repairs become necessary, the Cameron Gate Valve need not be removed from the line for expensive shop repairs. A convenient sealing element package makes it a new valve in less than half the time required for other inline valve repairs. You can COUNT ON CAMERON Gate Valves for lowest cost per operating cycle.

Cameron
IRON WORKS, Inc.
P. O. Box 1212 — Houston, Texas
Export Office: 7912 Empire State Bldg., New York City. In England: Cameron Iron Works Ltd., 76 Grosvenor St., London W. 1 England.

DEPT/Opinions

Views That Make News

"There is nothing indeed quite like government intercession in behalf of free enterprise—to make it no longer free."

—WALL STREET JOURNAL
Editorial

"It is regrettable that federal controls had to be applied. . . The least government regulation possible is desirable. . .

"But President Eisenhower tried for two years to get importing companies to comply with a voluntary program. . ."

—HOUSTON CHRONICLE
Editorial

"President Eisenhower's decision . . . is an unhappy victory for a group of special interests whose gain will be at the expense of the general welfare and perhaps, ultimately, even at the expense of those who sought this move.

"If . . . the government seeks to police the price of oil . . . the result will be a further major intrusion of government control in our economic life. . .

"To many abroad, this move will look like still another calculated act of economic warfare by the United States against its friends."

—NEW YORK TIMES
Editorial

"Obligatory restrictions [in the U. S.] don't modify substantially the actual situation of the oil industry in this nation [Venezuela].

"For some time now, voluntary restrictions have shown the way toward stability of markets and prices. It is this stability that we are interested in.

"Venezuela, like the United States, wants to avoid upsetting the oil industry either here or there through undue market competition.

"No violation of the Reciprocal Trade Treaty is involved, since the U. S. considers the question a matter of national defense. The treaty provides an escape clause for such cases."

—JUAN P. PEREZ ALFONZO
Minister of Mines & Hydrocarbons
Venezuela

"It is too soon to assess the full impact . . . [but] we believe that the compulsory limitation on Canadian oil exports to the U. S. creates a very grave situation for our already restricted oil market outlets."

—JOHN W. PROCTOR
General manager
Canadian Petroleum Assns.

"The mandatory control of imports . . . is most encouraging. It is especially important that products were included. . .

"The amount of present reduction in imports will perhaps not greatly affect current domestic production, but in time it will help. . . One day's additional production in Texas would mean 160,000 bbl.

"In my opinion, it is better to try to live under the provisions of this plan than to ask the Congress for a statutory control bill which would be very difficult to change to meet changing conditions."

—ERNEST O. THOMPSON
Senior member
Texas Railroad Commission

"The domestic oil producers who have pressed so long to secure the protection of oil import restrictions now find themselves faced with the hard reality that price controls may be the next step in the regulation of oil—which has always been an aggressive, self-sufficient industry."

—GEORGE F. GETTY II
President
Tidewater Oil Co.

"I'm happy they [the government] did it, but it might mean more control. . ."

—W. O. BARTLE
Texas producer

"I think this will cut down some of the gasoline oversupply. If so, this will tend to stabilize retail gasoline prices."

—JAMIE CLARK
Secretary
Texas Oil Jobbers Assn.

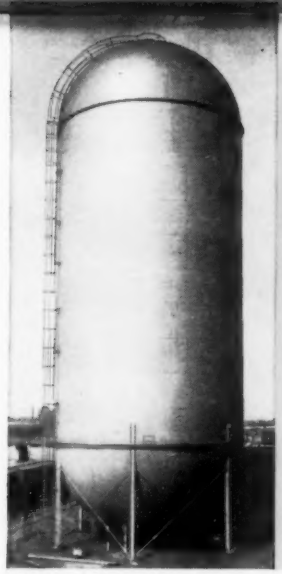
". . . They should have gone back to the 1954 levels. . ."

—JOHNNY MITCHELL
President
Christie, Mitchell & Mitchell

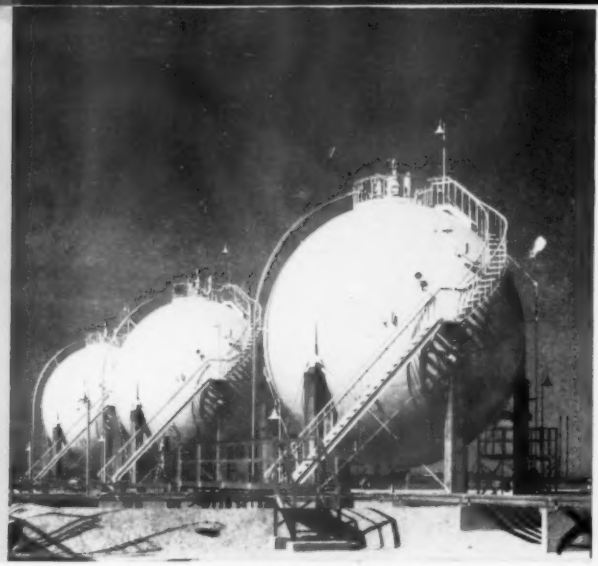
". . . It contains the same basic inequities of the Carson plan, mainly the virtual disregard of historical investment factors and imports patterns."

—ATLANTIC REFINING CO.

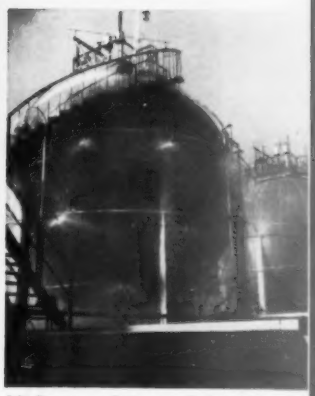
PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*



Pressure Gas Holder, 40' x 69'



30' Pressure Spheres, Gasoline



30' Pressure Spheres, Butadiene

EFFICIENT PRESSURE STORAGE OF VOLATILE PETROLEUM PRODUCTS

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STEEL PLATE WORK

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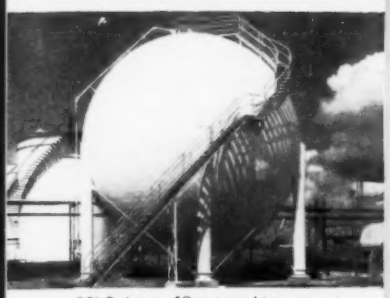
For gasoline, gases and many petrochemicals, compact Pressure Spheres and Bullets by Pittsburgh-Des Moines offer valuable savings of storage space and prevention of evaporation losses. Efficient design, dependable fabrication and expert erection, complete with all piping, valves and fittings, make PDM your logical choice for guaranteed satisfaction in modern pressure storage. Let us quote on your requirements.

Pressure Spheres and Vertical Bullets



38' Sphere, 40 psi working pressure

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Mr. M. B. Riordan, Vice President
B. J. Service, Inc., Long Beach, Calif., says:

"Low curb weight, price and maintenance deciding factors in our preference for

"We've owned Ford Trucks for almost eleven years and find Ford's low curb weight means bigger loads for us. Our Ford T-800's haul up to 1800 lb. more payload than other trucks of comparable size.

"We've been in the oil well business for 31 years supplying the materials, personnel and equipment to do a complete oil well servicing job. We operate 365 days a year and 24 hours a day. With $25,000-$30,000 tied up in each rig, we could lose money fast if our trucks weren't reliable. We feel our Fords do an outstanding job.

"You can't beat Ford in value, either! Not only is Ford's initial price low but we get three years of hard, rough use out of our Ford Trucks before we trade. That way we keep our costs 'way down.

"Maintenance costs are very reasonable, too. Not only are Ford Trucks easier to overhaul but parts costs are lower—our profit and loss statement proved that to us! And we can get Ford parts anywhere we operate. That's important in our kind of work because it's essential we stay on the job once we are started."

costs have been

Ford trucks"

Go Ford ward for savings

FORD TRUCKS COST LESS

LESS TO OWN... LESS TO RUN... LAST LONGER, TOO!

NOW!
CERTIFIED PROOF
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All tests conducted and results **CERTIFIED** by America's foremost independent automotive research organization*

*NAME AVAILABLE ON REQUEST

Send inquiry to: P.O. Box 2687 Ford Division, Ford Motor Co. Detroit 31, Michigan

'59 Ford Pickups Win Economy Showdown U.S.A.

—average 25.2% better gas mileage!

Impartial tests of the 1959 pickup models of all six makes prove conclusively that Ford's ½-ton pickups equipped with Short Stroke Sixes are the economy champs for '59.

HOW TESTS WERE MADE

Standard six-cylinder models of the six leading half-ton pickups first were put through exhaustive road trials. All '59 trucks—Ford and competitive—were bought from dealers, just as you would buy them. After at least 600 miles break-in, all were brought up to manufacturer's recommended specifications.

The trucks were then tested—by America's leading independent automotive testing firm—at constant speeds of 30, 45 and 60 miles an hour. Next came stop-and-go tests, ranging from moderate city traffic to normal retail delivery operation. Acceleration rates were carefully timed in each gear to insure accurate results for all makes.

HOW NEW '59 SIXES RATE IN GAS MILEAGE						
'59 FORD SIXES GIVE	25.2% more miles per gallon than Make "C"	31.1% more miles per gallon than Make "I"	9.6% more miles per gallon than Make "G"	42.6% more miles per gallon than Make "D"	22.0% more miles per gallon than Make "S"	25.2% more miles per gallon than the average of all makes

The '59 Ford Sixes, *in every test*, averaged more miles per gallon than every other make! Combining all tests, the '59 Fords led the average of all other '59 pickups by 25.2%.

WHAT'S THE SECRET?

How can a '59 Ford Six make four gallons do the work of five in other trucks?

First, of all pickup Sixes, only Ford has modern Short Stroke design. This new type of engine is basically far more efficient than long-stroke Sixes of other pickups. Example: Ford's Six delivers more usable horsepower than any other pickup Six.

Second, to this modern engine Ford has added a new economy carburetor. By metering fuel more precisely in both low- and high-speed ranges, Ford's new carburetor boosts gasoline mileage in every type of driving. And Ford's *Economy Carburetor* is *standard at no extra cost.*

Your Ford Dealer now has the complete report of Economy Showdown U.S.A. Why not call or visit him today and get the whole story firsthand?

Good Wells Make Good News

A Monthly Report on Wells That Are Now Worth More

March 20, 1959

In each of these frac jobs by Dowell, the treatment was especially designed for unusual well conditions. In each case, results were remarkably successful

- **Sweetwater County, Wyoming** (Old Oil Well) The pay was an open hole section of the Tensleep sand from 5267 to 5575 feet. Production had dropped from 285 bopd to 110 bopd. Operator ordered Petrojel*, and Dowell injected 30,000 gallons gelled crude and 30,000 pounds sand. 1025 gallons of the temporary plugging agent used in Fixafrac* were injected at mid-treatment. During fracturing, pressures ranged up to 4400 psi and injection rates up to 20 bpm. After treatment, production leveled off at 270 bopd. The entire cost of treatment, including cost of running three-inch tubing, was paid out in slightly over one month.

- **Northeast British Columbia, Canada** (New Oil Well) Perforations into the Triassic sandy lime were from 4251 to 4272 feet. In spite of 95 per cent acid solubility, acid treatments in this formation had failed because spent acid would not come back. Fracturing was difficult because the crude oil had one of the worst emulsifying characteristics of any oil ever tested. Dowell tests indicated that satisfactory results might be expected if a demulsifying agent and F.L.A.* (Fluid Loss Additive) were used. The operator ordered Sandfrac*. Dowell injected 20,000 gallons modified lease crude with 20,000 pounds sand down casing at 15 bpm. Well had been producing 65 bopd. After treatment, production was 115 bopd. Payout was only two months in a field where payouts were notoriously slow.

- **Ochiltree County, Texas Panhandle** (New Oil Well) Casing perforations into the upper Morrow sand were from 7510 to 7522 feet. Dowell tests on samples of the formation and produced fluid indicated use of BDA* (Breakdown Acid) and Sandfrac. 750 gallons BDA were injected to break down formation and remove drilling mud. After clean-up, well made 5 boph on test. Then another 500 gallons BDA were injected as a spearhead. This was followed by 480 barrels lease crude and 29,000 pounds sand. Injection rate was 38.2 bpm with pressures ranging from 2250 to 2800 psi. After the well was cleaned up, it tested 394 bopd.

- **Seminole County, Oklahoma** (New Oil Well) This well was completed through perforations into the Earlsboro sand from 3294 to 3332 feet. Operator wanted a low cost fracturing job so he ordered Sandfrac. Dowell injected 4000 gallons refined oil and 8000 pounds of sand. Fifty ball sealers were injected during treatment to improve fracture pattern. Injection was down tubing at 5 bpm and 2000 psi. This well originally tested 1½ bopd. After clean-up, it tested 150 bopd through a ¼-inch choke.

Whether your stimulation problem is unusual or routine, call your Dowell representative. He can help you select a treatment designed especially for your well. For detailed information or prompt service, call the Dowell engineer in your area. In Canada, call Dowell of Canada, Ltd.; in Venezuela, United Oilwell Service. Dowell, Tulsa 1, Oklahoma.

*Dowell Trademark

Services for the oil industry DOWELL
DIVISION OF THE DOW CHEMICAL COMPANY

60-Second Summary / WHAT'S HAPPENING IN OIL

March 20, 1959

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The mandatory imports plan will have immediate and long-range impacts. Right now, firms are figuring how to "live" with the new quotas—936,770 b/d for crude and unfinished oils and 460,000 for resid and other products. . . . p. 17

•

The oil industry appears headed for utility-type controls, a Petroleum Week editorial warns. At least a big step has been taken in that direction. . . . p. 88

•

How do you figure oil-finding costs? A Carter Oil economist outlines a method which his firm has been using for several years with good results. . . . p. 35

•

There's a feeling of optimism in the oil patch. No big boom is expected, but many are convinced that "things are getting a little better." . . . p. 3

•

The Air Force will soon be prodded again to use asphalt on airport runways. An upcoming congressional subcommittee report will insist that asphalt be given an even break with concrete in bids on noncritical runway areas. . . . p. 19

•

Brazil has shut the door to participation of U.S. capital in its oil development. Restrictive regulations, pushed by nationalists, have been adopted. . . . p. 70

•

Gilsonite appears to have won a solid role as an additive to oil-well cements. It has been tested extensively since its first such use, in 1957. . . . p. 27

•

A new "meter accounting system" may improve speed and accuracy in pipeline metering. It's being used for the first time on the Little Big Inch line. . . . p. 51

•

Sinclair has realigned its marketing setup to speed communications. Instead of one "home office" to supervise eight marketing divisions, it will now have three. . . . p. 82

•

U.S. oil reserves gained last year. Total hydrocarbon liquids rose 752.2-million to an estimated 36.7-billion total. But bear in mind that much of the gain was the result of "pencil" revisions of earlier estimates. . . . p. 15

•

A new process has been developed to remove low-octane paraffins from gasoline streams. The method, called Molex, was developed by Universal Oil Products. . . . p. 59

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

March 20, 1959

Don't look for a quick legal challenge of the mandatory control program. Here's why: The Administration has left the door open to adjustments. Furthermore, since the government has set up an appeals board, a court would probably require a company to take that route first before making a legal challenge. Finally, the Justice Dept. worked hard in advance to eliminate as far as possible any grounds for legal challenge.

There is some fear that refinery runs may be over-stimulated by the new plan. This stems from the government's plan to adjust quotas at six-month intervals. Some observers say this will cause refiners to push their runs in order to obtain higher quotas.

There's no doubt that, next to domestic producers, inland refiners are the most pleased by the new plan. They figure they can cut their crude costs by exchanging their import quotas for domestic crude at a saving, and they feel that the advantages coastal refiners have held will be reduced.

•

Allocations for imports of residual fuel and finished products will be issued soon. Applications to the Oil Import Administration were due today (Mar. 20), and determination of company quotas will require only a few days.

•

Sen. Joseph C. O'Mahoney is going ahead with plans for a hearing on imports. The Wyoming Democrat, who wants legislative controls over imports, says he will start hearings after Congress returns from its Easter recess.

•

The Justice Dept. is appealing a court ruling on pipeline shipper-owner dividends, in which Arapahoe Pipeline Co. was absolved of charges of violating a 1941 consent decree under the Elkins Act. The case will now go to the Supreme Court.

•

Petroleos Mexicanos is lining up further bank loans and credits in the U.S. and Europe to finance its pipeline and petrochemical plans. The latest: $12-million from a second group of four U.S. banks—New York Trust, Continental-Illinois, Guaranty Trust, and Bankers Trust; and $50-million from Credit Lyonnaise, of Paris. Pemex recently was granted a $40-million loan by U.S. banks and $20-million in credits from a group of European banks.

•

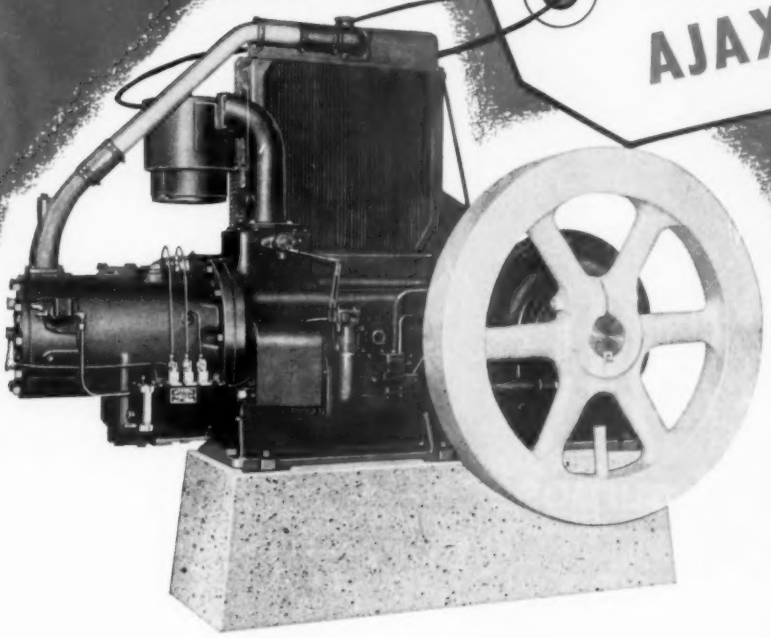
Venezuelan oil production was pushed to a new record in February of 3,095,937 b/d—about 102,000 b/d over the previous peak, set in January.

•

Argentina denies that it is backing out of a proposed oil deal with Russia. There had been reports that Argentina was dropping the deal because world oil prices had dropped below the Soviet price. But late reports from Buenos Aires say that negotiations are still under way.

The purchase price is NOT the cost!

AJAX OFFERS THE LOWEST ULTIMATE COST



DP-60, 9½" bore, 12" stroke. Recommended speed range 300 to 475. Rated BHP 60 at 475 RPM. Overall length 96½". Overall width 64¼". Total weight 6200#.

Thru-out oil land the smooth, true running Ajax flywheels symbolize the cheapest and most dependable long life power in the oil producing business.

Simplicity in design — Finest craftsmanship in building — Best possible materials — add up to the lowest ultimate cost.

Horsepower with the broadest range of engine capacities for the greatest number of applications in the field . . . eight sizes, 12 to 115 useable HP.

Yes, they cost a little more . . . but the bonus features give more horsepower per dollar for a longer time. Many AJAX units have run 10 years and longer without even cylinder head removal.

AJAX

AJAX GAS AND OIL ENGINES

AJAX also builders of

Pressure Pumps Compressors

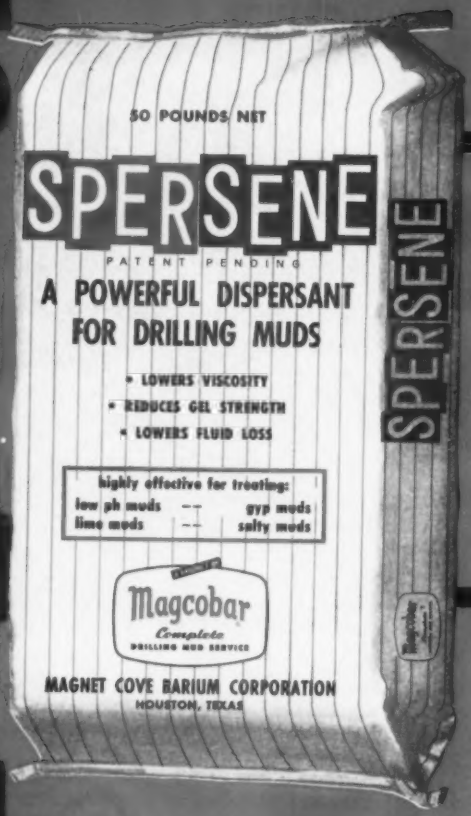
AJAX IRON WORKS CORRY, PENNSYLVANIA

OIL FIELD DISTRIBUTORS: The National Supply Co., Pittsburgh, Pa. • R. B. Moore Co., Bolivar, N. Y. • Bethlehem Steel Co., Supply Division, Tulsa, Oklahoma

Now

SPERSENE

Magcobar's *new* all-purpose dispersant cuts costs *in any kind of mud*



another *well done*

50-808

Spersene, a very versatile thinner, performs well in any mud. Its powerful thinning action combined with low cost make it a unique chemical for treating any drilling mud. You need no longer stockpile a number of dispersants at your well to meet different mud conditions. Now, you can simplify mud treatments with this new all-purpose dispersant and cut mud chemical costs, too.

Spersene costs less when you buy it; costs much less when you use it. As the tables show, Spersene lowers viscosity more effectively, at less cost, than any of today's leading thinners. This means a lower cost per barrel with Spersene. When projected to well volume, it means surprising savings. Whether you are using high or low pH mud, gyp mud, lime mud, or seawater or brackish mud, laboratory tests prove that Spersene

	Amount (pounds)	MATERIALS	Average Cost (Cents)	VISCOSITY (Yield Point-lb./100 ft.^{2})
gyp muds	1	Spersene	16.5	7
	1	Thinner A	18.5	14
lime muds	3.0	Spersene	49.5	6
	3.0	Thinner A	65.5	16
low pH muds	1	Spersene	16.5	8
	1	Thinner A	18.5	12
	2	Thinner B	20.0	20
	1	Thinner C	18.0	18
	1	Thinner D	17.0	31
sea water muds	4	Spersene	66	1
	4	Thinner A	74	3

is more efficient on basis of costs than any other dispersant. And it is very stable against the upsetting effect of salt.

Spersene is one more specific Magcobar solution to the problem of high drilling costs, one more development from the Magcobar laboratories that will increase your profit through more economical drilling. From spudding in to total depth, you'll find that the right products *used right* by Magcobar engineers can cut your drilling costs, too. Write for the new bulletin on Spersene.

Wherever your drilling operations, you can use Magcobar engineering and products. There are more than 500 stockpoints in the U.S. and Canada. Elsewhere, write Foreign Operations, P. O. Box 6504, Houston, Texas

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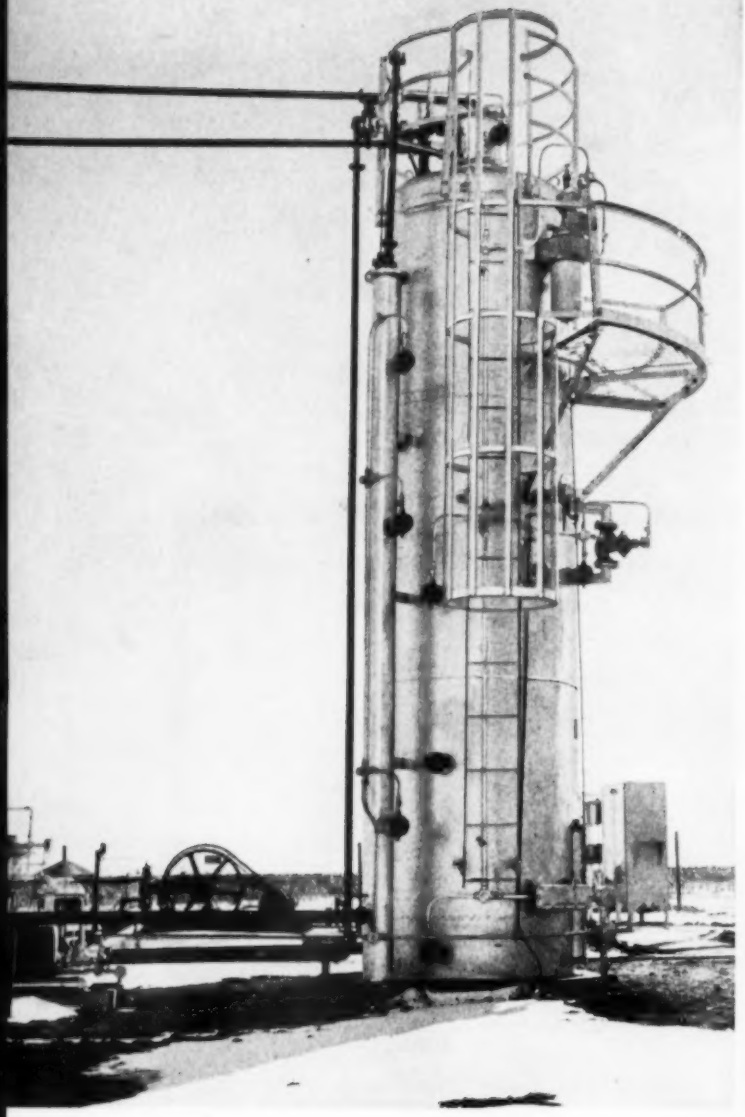

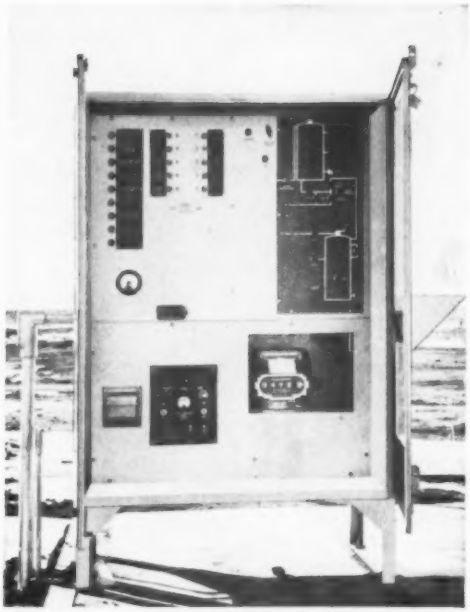

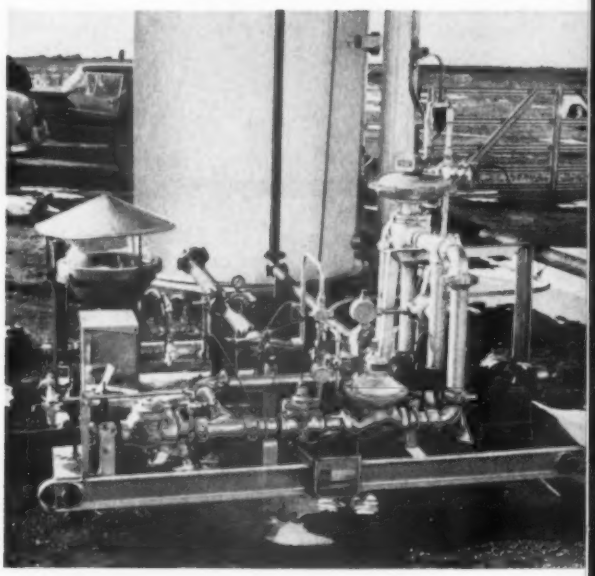

CONTINUOUS FLOW OF METERED OIL!

This newest addition to the BS&B PHANTO-GAGER line of LACT units was recently put into service on a Texas Panhandle lease. Unlike other positive volume type metering systems, this unit has the unique advantage of delivering a continuous flow of metered oil to the pipeline.

In addition to eliminating the cycling of the pipeline pump, this PHANTO-GAGER, because of its completely closed system, conserves more of the lighter hydrocarbons and increases the gravity of the crude delivered. It also eliminates the necessity for additional crude storage facilities.

Your BS&B Man will gladly help you work out details for a similar installation on your lease. Why not call him now?

OVER 60 YEARS
BS&B
ANOTHER EXAMPLE OF PRODUCT LEADERSHIP

BLACK, SIVALLS & BRYSON, INC., DEPT. I-EU3A P. O. BOX 1714, OKLAHOMA CITY

Reserves Rise Slightly to Record

- **Total liquid hydrocarbons up 2% to 36.7-billion bbl.**
- **Discoveries account for only one-eighth of additions to reserves, despite gain in "finding" rate.**
- **Gas reserves increase 3% to 254.1-trillion cu. ft.**

U.S. oil reserves showed a small gain last year, pushing up to a new peak. But the volume of new petroleum liquids found was the smallest for any postwar year.

Total reserves of liquid hydrocarbons—crude and gas liquids—rose 752.2-million bbl. during 1958 to a year-end estimate of 36.7-billion bbl. (table, page 16), according to the findings of the Joint Committee on Reserves of the American Petroleum Institute and the American Gas Assn.

Proved reserves of all petroleum liquids at the end of 1958 were 403-million bbl. above the previous high, reached in 1956.

The net addition (after production) to proved reserves last year compared with a 349.2-million bbl. decline in 1957.

Reserves of crude alone showed a gain of 235.5-million bbl. during 1958, to a new high of 30.5-billion bbl.

Reserves of natural gas liquids increased by 516.7-million bbl. to a new peak of 6.2-billion bbl., and now account for 17% of the total liquid hydrocarbon reserves.

Wildcat drilling accounted for only one-eighth of the total petroleum liquids reserves added last year. The remainder was "found" by pencil calculations—revisions of previous estimates, and extensions of known fields.

The volume of total liquids found by drilling in new areas amounted to 422,979,000 bbl., a drop of 22.3% from the volume found in 1957.

But the volume of reserves added by revisions and extensions jumped 50.9% last year to 3-billion bbl.—part of which is due to a reappraisal of secondary recovery reserves.

The ratio of reserves found by drilling to the total added for the year (before deducting production) was the smallest for any year since 1951. For the postwar period, the average ratio of discovery reserves to total added is 17%.

The reason such "pencil" revisions are used is that each year the joint API-AGA committee assigns only a small portion of the ultimate reserves of a pool or field to each discovery.

The decline in production last year also "aided" another statistic—the years'-supply ratio.

The ratio of year-end reserves to annual production, which has been declining over the past years, turned up slightly at the end of 1958 to a 13.5-year supply. It compared with a 12.4-year supply for all liquid hydrocarbon reserves at the end of 1957, and was the highest since 1954.

The significant bright spot in last year's search for new reserves was that the barrels found per foot drilled turned up, breaking a six-year downward trend.

Deducting gas discoveries (568) from the 6,950 rank wildcats drilled last year, gives a total of 31,405,877 ft. that were drilled in the hunt for new oil or gas liquids discoveries, an analysis of exploratory drilling data compiled by the American Assn. of Petroleum Geologists shows.

Dividing the footage drilled in the search for new oil into the new liquid hydrocarbon reserves found shows a "finding rate" of 13.4 bbl. per ft. drilled, up 2 bbl. per ft. from 1957.

The upturn in the oil finding rate last year indicates that increased wildcatting could result in improvement in domestic reserves.

The 31.4-million ft. drilled last year in the hunt for new oil reserves were nearly 5-million ft. under 1957, and almost 8-million ft. less than in 1956.

A statistical analysis shows that if

Estimated Crude Reserves in U.S.

(In thousands of barrels)

	Proved Reserves 12 31 57	Extensions and Revisions 1958	New Discoveries 1958	Production 1958	Net Changes in Reserves 1958	Proved Reserves 12/31/58
Ala.	34,409	10,125	—	5,948	+ 4,177	38,586
Ark.	304,959	39,754	1,235	28,083	+ 12,906	317,865
Calif.*	3,759,754	404,689	15,659	313,672	+ 106,676	3,866,430
Colo.	309,939	124,479	6,081	48,439	+ 82,121	392,060
Ill.	654,746	26,787	6,066	80,010	— 47,157	607,589
Ind.	66,736	15,043	1,301	11,611	+ 4,733	71,469
Kan.	947,484	80,866	13,944	119,860	— 25,050	922,434
Ky.	138,040	— 865	5,000	15,818	— 11,683	126,357
La.*	3,857,569	388,388	77,718	279,682	+ 186,424	4,043,993
Mich.	49,492	4,387	290	9,201	— 4,524	44,968
Miss.	359,550	32,931	24,272	38,065	+ 19,138	378,688
Mont.	319,991	41,459	5,145	28,796	+ 17,808	337,799
Neb.	63,059	18,624	7,590	20,031	+ 6,183	69,242
N. M.	831,744	143,759	14,406	95,788	+ 62,377	894,121
N. Y.	37,533	—	—	1,730	— 1,730	35,803
N. D.	258,221	67,293	2,465	13,900	+ 55,858	314,079
Ohio	68,150	9,166	—	6,507	+ 2,659	70,809
Okla.	1,941,521	139,749	15,377	198,519	— 43,393	1,898,128
Pa.	126,490	—	—	6,658	— 6,658	119,832
Texas*	14,555,140	566,771	109,659	909,354	— 232,924	14,322,216
Utah	140,034	82,590	650	24,635	+ 58,605	198,639
W. Va.	52,545	1,750	—	2,191	— 441	52,104
Wyo.	1,419,718	94,885	7,701	113,587	— 11,001	1,408,717
Misc.	3,581	883	170	645	+ 408	3,989
Total U.S.	**30,300,405**	**2,293,513**	**314,729**	**2,372,730**	**+ 235,512**	**30,535,917**

*Includes offshore reserves.

Liquid Hydrocarbons Reserves in U.S.

(in thousands of barrels)

	Proved Reserves 12/31/58	Extensions and Revisions 1958	New Discoveries 1958	Production 1958	Net Changes in Reserves 1958	Proved Reserves 12/31/58
Ala.*	34,409	10,125	—	5,948	4,177	38,586
Ark.	342,099	39,095	1,677	30,856	9,916	352,015
Calif.*	4,065,483	428,911	16,184	341,829	103,266	4,168,749
Colo.	320,904	135,584	6,101	49,261	92,424	413,328
Ill.	666,539	27,546	6,066	81,612	— 48,000	618,539
Ind.	66,850	15,068	1,301	11,631	4,738	71,588
Kan.	1,136,639	96,862	14,209	125,724	— 14,653	1,121,986
Ky.	143,747	32,137	6,501	18,556	20,082	163,829
La.*	4,876,767	570,185	123,079	330,083	363,181	5,239,948
Mich.	50,729	4,674	371	9,304	— 4,259	46,470
Miss.	413,951	35,882	25,162	41,125	19,919	433,870
Mont.	327,796	41,465	5,185	29,150	17,500	345,296
Neb.	70,194	17,707	7,590	20,550	4,747	74,941
N. M.	1,152,292	255,774	16,149	112,856	159,067	1,311,359
N. Y.	37,533	—	—	1,730	— 1,730	35,803
N. D.	280,921	77,140	2,465	15,208	64,397	345,318
Ohio	69,960	8,986	—	6,519	2,467	72,427
Okla.	2,284,164	180,756	18,819	228,104	— 28,529	2,255,635
Pa.	129,950	199	99	6,731	— 6,433	123,517
Texas*	17,826,757	826,570	159,694	1,098,838	— 112,574	17,714,183
Utah	140,125	97,351	700	24,638	73,413	213,358
W. Va.	75,457	43,496	3,249	6,812	39,933	115,390
Wyo.	1,470,883	97,067	8,208	116,565	— 11,290	1,459,593
Misc.	3,616	889	170	648	411	4,027
Total U.S.	**35,987,765**	**3,043,469**	**422,979**	**2,714,278**	**752,170**	**36,739,935**

*Include offshore reserves.

Estimated U.S. Natural Gas Reserves

(Millions of cu. ft.-14.65 psia. at 60F)

	Proved Reserves 12/31/57	Extensions and Revisions 1958[a]	New Discoveries 1958	Net Change in Underground Storage[b]	Net Production 1958[c]	Proved Reserves 12/31/58
Ark.	1,283,022	111,867	36,951 +	130	43,633	1,388,337
Calif.[d]	8,952,893	378,066	57,047 +	15,381	436,865	8,966,522
Colo.	2,380,679	47,143	52,539 —	4,676	126,445	2,349,240
Ill.	166,372	18,877	0 +	4,299	19,020	170,528
Ind.	30,952	4,910	0 —	1,362	3,931	30,569
Kans.	19,295,978	1,497,136	27,027 —	4,391	581,903	20,233,847
Ky.	1,225,045	45,738	10,930 +	1,616	68,000	1,215,329
La.[d]	51,435,954	4,122,570	1,911,124	0	2,357,786	55,111,862
Mich.	444,028	56,501	16,188 —	6,290	12,314	498,113
Miss.	2,297,740	408,115	74,627 +	1,290	183,395	2,598,377
Mont.	670,450	297	38,477 +	2,261	29,472	682,013
Neb.	189,339	32,447	1,800 +	0	15,371	143,321
N. M.	22,258,009	(–) 528,926	175,465 +	100	724,628	21,180,020
N. Y.	93,382	6,375	1,125 —	1,344	3,099	96,439
N. D.	743,432	399,699	0	0	18,661	1,124,470
Ohio	901,814	(–) 78,420	13,620 +	14,913	33,875	818,052
Okla.	14,259,480	1,698,761	159,370 —	7,545	903,297	15,206,769
Pa.	853,595	97,266	22,135 +	1,992	104,974	870,014
Texas[d]	113,084,518	4,598,030	2,799,626 +	10,519	5,446,950	115,045,743
Utah	859,294	234,368	2,213	0	37,824	1,058,051
Va.	37,521	2,975	525	0	2,600	38,421
W. Va.	1,560,930	139,247	30,720 +	11,136	184,400	1,557,633
Wyo.	3,457,433	153,864	176,170 +	1,511	139,160	3,649,818
Misc.	87,395	6,796	3,419 +	18,362	7,423	108,549
Total U.S.	**246,569,255**	**13,388,808**	**5,611,098**	**57,902**	**11,485,026**	**254,142,037**

[a] Excludes gas loss due to natural gas liquids recovery.

[b] The net difference between gas stored in and gas withdrawn from underground storage reservoirs, inclusive of adjustments and native gas transferred from other reserve categories.

[c] Net production equals gross withdrawals less gas injected into producing reservoirs. Changes in underground storage and gas loss due to natural gas liquids recovery are excluded. Fourth quarter production estimated in some instances.

[d] Includes off-shore reserves.

the 1957 wildcat footage had been maintained in 1958, an additional 64-million bbl. of new reserves would have been added, based on the 1958 oil finding rate.

On a similar basis, 100-million additional bbl. would have been added had 1958 drilling been up to the 39.2-billion ft. drilled in 1956—when the actual finding rate was 1 bbl. per ft. higher than last year.

Louisiana again led all states in additions to reserves (cover).

Aided significantly by increases offshore, Louisiana's crude reserves gained 186.4-million bbl. last year, and its total liquid hydrocarbon reserves jumped 363.2-million bbl.

Production for the year declined 15-million bbl.

At the end of the year, Louisiana's liquid hydrocarbon reserves totaled 5.2-billion bbl., 14.2% of the nation's reserves, a slight percentage improvement over 1957.

California had a gain of 106.7-million bbl. in crude reserves, and a slight decline in gas liquids reserves, for a net increase of 103.3-million bbl. in liquid hydrocarbon reserves.

New Mexico and Utah both had big gains. In New Mexico, crude reserves increased 62.4-million bbl., and total liquids were up 159.1-million. Utah's crude reserves increased 58.6-million bbl., and total liquids were up 73.4-million.

In Texas, where output of all liquid hydrocarbons dropped 158-million bbl. last year, reserves declined by 112.6-million bbl., and the state lost ground in its ratio of reserves to the U.S. total.

Crude reserves alone dropped 232.9-million bbl. in Texas.

Texas' reserves of 17.7-billion bbl. of liquid hydrocarbons amounted to 48.2% of the nation's total, down 1.2 percentage points from 1957.

Natural gas reserves last year increased 3.1%, to total 254.1-trillion cu. ft., the smallest gain in four years.

Louisiana had the largest gain in gas reserves, with an increase of nearly 4-trillion cu. ft. to a year-end total of 55.1-trillion cu. ft.

Texas had a gain of 2-trillion cu. ft. to 115-trillion; Kansas' reserves increased 1-trillion cu. ft. to 20.3-trillion; Oklahoma's reserves increased 1-trillion cu. ft. to 15.2-trillion; and New Mexico had a decline of 1.1-trillion cu. ft. to 21.2-trillion.

Nearly 30% of the gas reserves added last year resulted from discoveries. That was well under the 44% ratio of 1957, and somewhat below the average ratio of the post-war years.

Controls Will Shift Pricing Patterns

The switch to a mandatory import control plan, which became effective last week, will bring some significant changes in the pattern of oil industry operations.

Analyzing the outlook this week, industry observers say that the unprecedented peacetime federal participation in oil operations primarily will mean that:

- Oil pricing will split in two—"protected" U.S. prices and highly competitive prices elsewhere in the free world.
- Some foreign producing nations may seek minimum price guarantees from concessionaire companies.
- Both of those factors, sooner or later, will force some of the U.S. companies that have recently ventured abroad to sell out.
- Rates of U.S.-flag tankers will recover from recent lows, but foreign-flag rates will continue to deteriorate.
- Domestic crude and product prices, with a firmer tone, will improve the positions of producers and independent refiners, but could squeeze out some private-brand marketers in the long run.
- Emphasis will shift on expansion in refining capacity. The advantages of coastal locations in the U.S. will be minimized. Some growth planned for the U.S. will be changed to foreign locations.
- Both domestic production and refinery runs will increase.

I. A Scramble Abroad

Foreign operators already are beginning to scramble for new outlets for crude, and the competition promises to become intense.

In Argentina, for example, two major international companies—Jersey Standard and Shell—reportedly with more favorable credit offers to the government's oil company, contributed to the latter's decision to halt temporarily its trade agreement with Russia.

The Russian deal with Argentina called for delivery of 1-million tons of 32-gravity oil at about $2.33 a bbl. delivered.

Shell reportedly has offered Argentina a credit of $50-million over four years for crude purchased at reasonably decreased prices.

The Russian agreement also involved a $100-million credit to Argentina at 2½% interest for the purchase of Russian oilfield equipment.

All large and medium-sized producers abroad are looking into new market outlets, which may involve

Districts I-IV

Old Importers

Crude and Unfinished Oils (barrels daily)

	Tentative Allocation	Old Voluntary Allocation*
Atlantic	40,160	55,900
Aurora	5,400	3,500
Bay Refining	2,160	2,700
Cities Service	22,240	27,800
Clark	3,220	2,000
Continental	12,610	5,000
Crown Central	3,860	9,900
Danaho	400	500
Delta	2,400	3,000
Eastern States	12,480	27,900
Great Northern	22,480	28,100
Gulf Oil	76,080	111,400
Hess, Inc.	7,840	35,100
Ingram	2,800	3,500
International Ref.	8,400	10,500
Murphy Corp.	3,440	4,300
Northwestern	9,200	11,500
Ohio Oil	4,330	3,500
Phillips	16,790	10,200
Pure Oil	13,540	5,000
Republic	3,200	4,000
Shell	22,760	6,400
Sinclair	42,400	60,400
Socony	45,760	76,900
Southwestern	3,700	6,600
Stand. Calif.	45,520	65,400
Stand. Ind.	33,730	50,200
Stand. N. J.	49,120	61,400
Stand. Ohio	11,130	8,700
Sun Oil	34,400	43,000
Sunray	9,420	5,000
Tennessee Gas	3,410	3,500
Texas City	3,200	11,000
Texaco	37,120	60,200
Tidewater	23,360	49,200
United Ref.	2,400	3,000

*Unfinished oil imports (May-June 1958 average) have been added to voluntary plan crude quotas.

New Importers

	Tentative Allocation
Advance Ref.	260
Allby Asphalt	260
Allied Materials	250
Am. Petrofino	4,050
Anderson-Prichard	3,320
Ashland	11,300
Bell Oil	2,070
Berry Asphalt	340
Berry Ref.	570
Cactus Pet.	220
Champlin Oil	2,830
Cosden Pet.	4,080
Cooperative Ref.	3,690
Cotton Valley	340
Henry H. Cross	330
Cracker Asphalt	150
Delhi Taylor	3,290
Derby Ref.	1,860
Eddy Ref.	230
El Paso Natural	1,510
Empire State	290
Famariss Oil	170
Farmers Union	1,890
Frontier Ref.	2,090
Great Western	220
Howell Ref.	300
Hunt Oil	590
Husky Ref.	670
Ill. Farmers Supply	470
Ind. Farm Bureau	1,400
Kendall Ref.	460
Kerr-McGee	3,990
Lagloria Oil	1,570
Laketon Asphalt	220
Leonard Ref.	2,710
Lion Oil	3,150
Louisville Ref.	820
Macmillan Pet.	380
Malco Ref.	1,320
Metropolitan Pet.	1,440
Mid-America Ref.	250
Midland Coop.	1,290
Monarch (Texas)	250
Naph-Sol Ref.	590
Natl. Coop. Ref.	2,870
Paluxy Asphalt	310
Pennsylvania Ref.	140
Petroleum Ref.	220
Petroleum Spec.	580
Pontiac Eastern	1,390
Pontiac Ref.	4,350
Premier Oil	1,550
Quaker State	930
R. J. Oil & Ref.	410
Rock Island Ref.	1,610
Seminole Asphalt	190
Shamrock Oil	2,270
Sioux Oil	460
Shelly Oil	5,010
L. Sonneborn	160
Southland	480
Suntide	4,140
Texas Calgary	190
Union Oil Calif.	400
Vickers	1,510
Vulcan Asphalt	210
West Branch Ref.	200
Western State Ref.	500

District V

	Tentative Allocation	Old Voluntary Allocation
Bankline Oil	1,840	2,300
Caminol Co.	2,240	2,800
Century Oil	1,200	1,500
Douglas Oil	4,140	4,400
Edgington Oil	2,240	2,800
Envoy Petroleum	960	1,200
Fletcher Oil	4,160	5,200
General Petroleum	19,120	24,100
Golden Eagle	1,840	2,300
Macmillan Petroleum	1,840	2,300
Mohawk Petroleum	2,360	2,900
Palomar Oil & Ref.	400	500
Powerline Oil	2,560	2,700
Richfield	14,630	8,600
Shell Oil	24,320	30,700
Signal Oil & Gas	3,200	4,000
Socal Oil & Refining	800	1,000
Stand. Calif.	27,690	28,000
Sunland Refining	1,840	2,300
Texaco	15,440	19,400
Tidewater	28,400	35,800
Union Oil of Calif.	17,380	16,400
U.S. Oil & Refining	6,000	11,200
Wilshire Oil	13,600	17,100

more integrated operations by many.

Plans for increasing foreign outlets for crude produced abroad were being laid long before the new mandatory controls on imports became effective.

Some of the medium-sized U.S. producers abroad indicated their future moves with the recent establishment of foreign oil sales departments.

Others are planning to enter foreign refining operations. Getty Oil, for example, has already acquired an Italian refinery.

The new competitive push abroad will have obvious impact on oil prices. The first effect will be a break between Caribbean product prices and Gulf Coast prices (page 80).

The long-term trend of Caribbean crude and product prices will be to drop to the delivered level of Middle East prices wherever Venezuelan oil competes for markets.

It all adds up to the fact that the lowest-cost producers will have the advantage in foreign markets.

II. Stronger U.S. Market

There is no doubt that the mandatory import controls will give strength to crude and product prices, which have generally been weak for some time.

The first indication of renewed strength in domestic crude prices came this week, when Union Oil Co. of California announced an "upward revision" of its posted prices in California and the Four Corners area on Apr. 1.

On Mar. 1, the company cut California crudes from 2¢ to 60¢ a bbl. and Four Corners oil from 57¢ to 60¢.

Product prices—particularly gasoline—already are strengthening. Motor fuel prices have advanced slightly in Mid-Continent, Midwest, and West Coast markets.

But the flood of product imports that is expected until finished product imports come under mandatory controls Apr. 1 will tend to minimize gasoline price advances in other markets in March.

Just how much strength a higher demand for domestic crude will add to prices depends, of course, on how closely the federal government watches prices.

The government's plan to study petroleum prices comes at a time when most prices—particularly of crude and gasoline—are down.

But most observers predict that the higher demand for domestic crude will bring higher postings in many areas.

Most predictions are that no general advance in crude postings will be made in the immediate future, but that domestic prices will go up more or less as they came down—based on refinery realizations.

Demand may increase domestic crude output during the next nine months by as much as 200,000 b/d, over the present level of 7.2-million b/d.

This assumes that demand will continue to run as expected (9.8-million b/d average for 1959), and that over-all imports for 1959 will average about 1.6-million b/d—2.1-million b/d in the first quarter and about 1.4-million b/d for the rest of the year.

Refinery runs also are expected to average higher than the 8.1-million b/d estimated for all of 1959, because many refiners step up input just in case the import allocation method may be changed this year.

Some Washington observers now predict that the graduated scale of refinery runs for allocations of crude and unfinished oil imports may be abandoned by the start of 1960 in favor of a "more equitable" flat percentage basis.

There is some fear that the present graduated scale, which favors smaller refiners, could lead to legal snarls.

The tentative quotas for the period through June 30 exceed the so-called 9% ratio to demand east of the Rockies that was ordered in the President's import proclamation.

Such a ratio would limit imports of crude, unfinished oils, and finished products other than residual to 757,000 b/d.

The crude and unfinished allocation of 738,570 b/d (table, page 17), plus an anticipated 61,000 b/d of light finished products, would put the total allocation 42,500 b/d over the ceiling.

Views on Crude Reserves Vary

A divergence of views on the present status of domestic reserves, and probable future developments, came out clearly this week during an industry meeting in Dallas.

The presentations, made during the combined session of the American Assn. of Petroleum Geologists and the Society of Economic Paleontologists & Mineralogists, also underscored some dissatisfaction with present methods of computing reserves figures.

On one hand, Morgan J. Davis, president of Humble Oil & Refining Co., declared the nation can count on "a minimum additional [domestic] supply of 70-billion bbl. of crude oil from fields already discovered and acreage already under lease."

Analyzing the methods by which revisions and extensions of known field reserves have added an average of 2.2-billion bbl. of reserves per year for more than 20 years, Davis asserted:

"In view of the large number of fields found in recent years, the prospects are quite good that estimates of recovery from known fields by present methods will be raised within 10 years by 20-billion to 25-billion bbl."

Davis estimated that new discoveries on untested prospects "may exceed 35-billion bbl." He noted that there are some 350-million acres under lease, and he used a "conservative assumption" that only 2% of this leased acreage "will produce oil" to arrive at the 35-billion bbl. figure.

To this, he said, could be added "about 20-billion bbl." of additional proved oil from improved secondary recovery methods.

On the other hand, M. King Hubbert, of Shell Development Co., said current indications are that ultimate U.S. crude reserves should total about 150-billion bbl.

Hubbert said that past performance indicates that production peaks follow discoveries "by the nearly constant interval of 10 to 11 years."

"The peak in the rate of discovery occurred about 1932 or 1933, and the peak in the rate of production is expected to occur about 11 years later, or about 1964," Hubbert said. "The peak of proved reserves, which should occur between these two dates, appears to be about 1957 or 1958."

It is possible, Hubbert added, that improved secondary recovery practices might account for another 50-billion bbl. of oil.

"There is no question that the recovery efficiency of oil production can be increased," Hubbert said.

Conceding that his figures "may represent only a temporary setback due to limitations of our exploratory techniques and philosophy," Hubbert said the biggest room for improvement "appears to be petroleum geology itself."

He declared that the industry must return to such "fundamental questions" as the origin of oil, its migration, and "its positions of entrapment."

ASPHALT COULD BE USED for more than half of the average military runway under standards that may be specified by law, as . . .

Congressional Group to Push Asphalt

Some congressional leaders are planning to make sure that the Air Force puts into effect its agreement to accept asphalt bids on military airport runways.

Since 1956, asphalt has been banned for all Air Force runways used by combat or combat-support aircraft.

But last fall, an Air Force official told a congressional subcommittee that asphalt would now be made eligible for use in certain parts of the runways (PW—Dec.5'58,p16).

In the plan outlined at that time, concrete would be mandatory for the first 1,000 ft. at each end of the runway and for a 75-ft. center strip connecting these two ends.

Asphalt could be used for the remainder of the runway. In a typical situation, involving a runway 12,000 ft. long and 300 ft. wide, asphalt would be eligible for 2¼-million sq. ft. of a total of 3.6-million sq. ft. (illustration, above).

A congressional committee report, soon to be released, will make a specific request that the Air Force give equal consideration to bids by asphalt contractors.

The committee was impressed during the hearings last fall by a report from army engineers on tests showing that flexible paving can withstand heavy bomber loads and traffic.

The lawmakers concluded that asphalt paving was not only just as safe, but also cheaper in many cases, than portland cement concrete paving.

The committee report will be only one step in an effort by Congress to end the asphalt-concrete controversy. Its next planned move will be a provision in the law which will provide guidelines for the Air Force to follow in doling out contracts.

However, these standards will be in somewhat general terms, still leaving the Air Force considerable leeway.

Therefore, as a final step, key lawmakers close to the issue plan to make it clear to the Air Force that if congressional intent is sidestepped—and asphalt is pushed out of the picture again—the congressional "watchdog" committees will pounce again.

This simply means that if the Air Force should continue to show reluctance to use asphalt, it would be hauled up on the congressional carpet.

A veteran congressman says such watchdog activities by Congress "are in many cases the most effective means we have of seeing that these administrative officials carry out our legislative intentions."

Congress may put a further squeeze on the Air Force through appropriations provisions.

It is considered likely that a formal requirement may be included in the military construction appropriations bill, probably in the provisions specifying funds for airfield construction.

The struggle by asphalt manufacturers and contractors to get asphalt used in runway construction has been a long one.

The issue reached a climax last year in a special test at a Columbus (Miss.) Air Force base.

Both asphalt and concrete strips were subjected to thousands of simulated B-52 landings. Results were checked carefully. The general conclusion was that asphalt had met the test, at least for use on the side strips.

Oil Man's Album

A Side of the Story That's Oft Forgotten

Union Oil Co.'s Lakeview No. 1 is something of a legend in the oil industry. Back in 1910, it hurled a stream of crude two feet in diameter with such force it tore a huge hole in the earth. In 18 months, it produced 9-million bbl. But now, as the picture at the right above demonstrates vividly, the Lakeview No. 1 is dead.

(No. 26 in a Petroleum Week series.)

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What's New / IN THE INDUSTRY

The Teamsters Union is showing signs of making a major drive into the oil industry. The first apparent target: Key independent unions. James R. Hoffa, the Teamsters' boss, has been approaching such groups personally. Last week, for example, he made a speech to independent union members at Esso Standard's Baton Rouge (La.) refinery—and drew a big turnout. He has made similar appearances elsewhere, and other meetings are planned.

•

Octane requirements by the military may go down instead of up. J. B. McCauley, deputy director, Defense Research & Engineering, explained why at this week's meeting of the Western Petroleum Refiners Assn.: The military is researching for an engine that could use various fuels indiscriminately. Such an engine probably would not tolerate octane ratings above 83/91, he said.

•

A new simplified test of corrosion inhibitors for use on well equipment can substantially reduce the damage by corrosion, it was announced this week by one of the test's developers, J. R. Bruce, a Shell Oil Co. engineer in the Tulsa Production Dept. At the meeting of the National Assn. of Corrosion Engineers, in Chicago, he said the test greatly simplifies the determination of which corrosion inhibitor is best suited for protection against corrosive water conditions existing in a specific well.

The advantage of the test, as Bruce explains it, is that screening of as many as 20 inhibitors can be done in two days in the laboratory, whereas it would be two or three years before field results could be obtained. Bruce said that in 94% of the samples tested thus far, the inhibitor that showed the best results in the lab also proved best in the field.

•

Greatest impact of nuclear energy on fossil fuels will be felt in three areas: electrical power production in central stations, heat production in central heating plants, and the powering of ocean transportation. This was predicted this week by W. B. Heroy, Geotechnical Corp., Dallas, at the meeting of the American Assn. of Petroleum Geologists and the Society of Economic Paleontologists & Mineralogists, in Dallas.

•

The National Petroleum Council has appointed committees to make three special studies for the government. The committees are: Use of Radio & Radar, Petroleum Storage Facilities, and National Emergency Oil & Gas Mobilization. In keeping with new NPC rules, the committees and their membership were first submitted to the Interior Dept. for approval.

•

The Justice Dept. may make its annual report on the Interstate Oil Compact Commission early this year. It's due in September, but the Justice Dept. wants to present it before Congress adjourns.

•

The government this week listed a bill of particulars in its "price conspiracy" charges against 29 oil firms. The 53-page document presented in a Tulsa court consisted largely of a listing of dates and names of some companies and company officers who "engaged in conversations" relative to prices. It also listed a series of events which, the government feels, tend to imply conspiracy.

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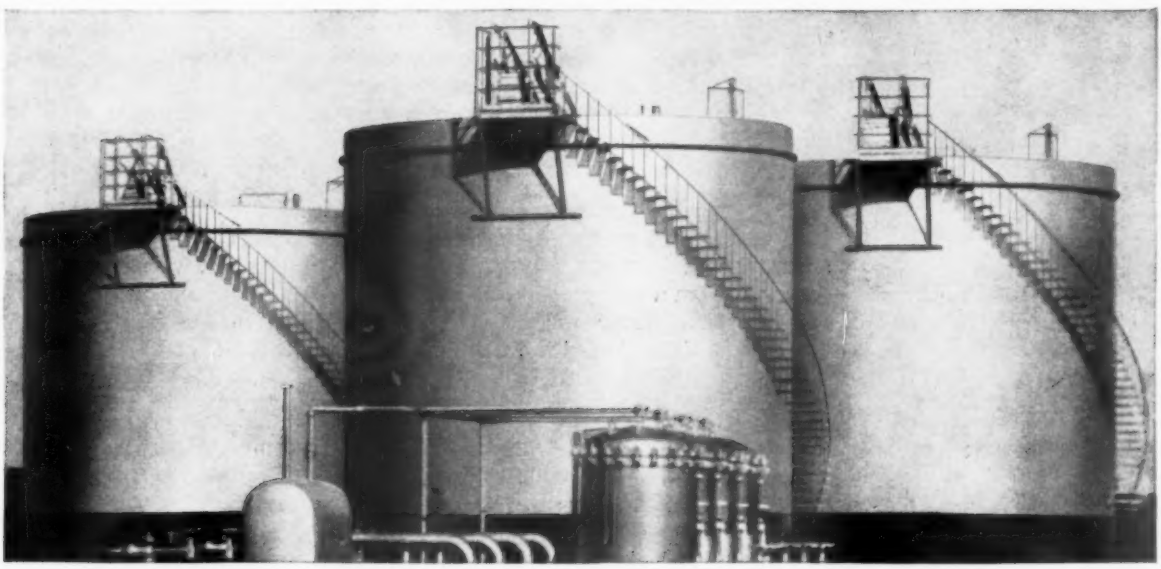

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau

March 20, 1959

The background of Washington's oil imports action sheds considerable light on the new mandatory controls. First, look at the situation that existed in mid-1958. The Administration had tried to tighten its voluntary program by adding unfinished oils to the plan, but the entire concept had some fatal troubles: The voluntary plan could not accommodate all companies that wanted to import oil; noncomplying companies ignored the program; and importation of finished products rose substantially.

The government started searching for a new program last fall. The first major proposal was the "Carson Plan," a voluntary program based on a straight proportionate division of imports tied to refinery runs. But historic importers said they would fight the program, and the idea was dropped—temporarily. Then came study of a series of voluntary plans designed to recognize the position of long-established importers.

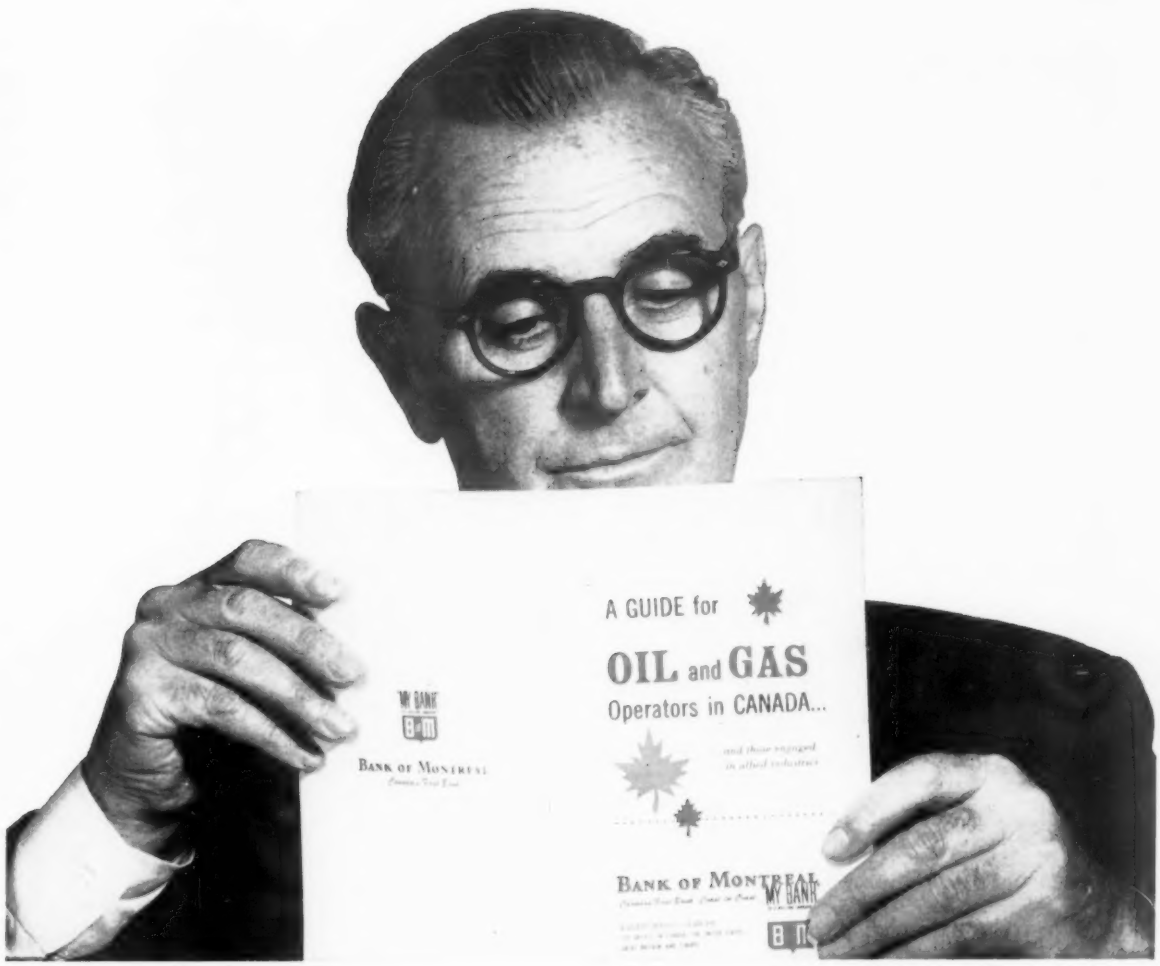
The State and Commerce Depts. fought to give preference to historic positions of importers. Former Under Secretary of State Herbert Hoover, Jr., continued as an advisor to the State Dept. long after his official resignation and became a power in the oil imports in-fighting. Hoover teamed with Frederick Mueller, now Under Secretary of Commerce, and offered an "80-20" voluntary plan, similar to one advanced by Atlantic Refining Co. Historic companies would have divided 80% of allowable imports, with the remainder being split on a refinery-runs basis between all U.S. refiners.

But Treasury Secretary Robert Anderson opposed this idea. Anderson, whose views carried weight at the White House, also had the political advantage of Johnson-Rayburn friendship in Congress. When Anderson returned from a trip abroad last fall, he was quickly told by Interior Dept. officials that Hoover and Mueller were pressing their plan. Anderson's strong opposition forced the Cabinet committee to look for other methods of imports division.

Three months ago, the Justice Dept. killed all hopes for a revamped voluntary program. The Cabinet committee had compromised on a "60-40" voluntary plan, which would have given 60% of imports to historic importers and 40% to all refiners on the basis of runs. The plan was polished, printed, and ready to go when the Justice Dept.—though not a member of the committee—exercised its power as the Administration's legal advisor. Justice Dept. antitrusters prevailed on Atty. Gen. William Rogers to send a firm recommendation to the White House that the revised plan be squelched. It was.

A mandatory program then became inevitable. After more vain attempts to revive the voluntary concept, the Cabinet committee turned to mandatory controls. This question was how to divide allocations. Officials turned back to the original Carson Plan—this time on a compulsory basis. But the idea of strict division on the basis of refinery runs was deemed too harsh. Historic companies were tossed a small bone by a provision that no company's quota will be cut by more than 20% below the quota it had under the voluntary plan—at least for the present. Even these small concessions, however, raised some doubts among some government lawyers that the program will be defensible in court.

The Administration, keenly aware that the plan might be subject to sharp attack, sought to install as much flexibility as possible. The first period will be something of a shakedown cruise, with adjustments later to help make the controls machinery run smoothly.



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PETROLEUM COMMENTS

By Wanda M. Jablonski

When the Pinch Leads to Blisters

The recent 18¢ cut across the board in Middle East crude oil prices—the first in a decade—is the story of the shoe that kept pinching increasingly until the blisters finally became unbearable.

On the surface, the cut would seem merely to formalize the substantial discounts below posted prices at which Middle East crude had been moving to independent (nonaffiliated) buyers in Europe and the Far East.

The basic causes, however, run deeper.

For one thing, discounted sales to nonaffiliated refiners represent only a small fraction of total Middle East sales. For another, it's doubtful that, in today's cut-throat market, a mere lowering of general postings will do much to alter competitive discounting to independent outlets.

The real rub lay elsewhere: The vast bulk of Middle East crude is sold to affiliated refineries in the Eastern Hemisphere. The integrated international companies invoice such crude to affiliates at the posted prices—since the profit-sharing agreements with Middle East governments are based on the posted prices of the crude, rather than on the actual market values that might be realized.

As a result, the affiliates have found themselves in an increasingly untenable squeeze between their static crude oil cost and cut-price market competition from independents with lower crude costs.

With the pressure of excess supplies, things got so bad by last year that virtually no major refining and marketing affiliate in the Eastern Hemisphere was able to operate at a profit.

As one leading international company put it: "Generally speaking, all our European refining, transportation, and marketing operations lost money in 1958. In effect, we had to subsidize their losses with Middle East crude profits. Obviously, this situation could not go on much longer. Something had to give."

* * * *

While the Middle East price cut came shortly after the reductions in Venezuelan and U.S. crude prices, it did not follow these reductions. The 18¢ drop in the Middle East was sharper than the 15¢ cuts for similar Western Hemisphere crudes. And Middle East prices were brought slightly below their levels before the 1957 advance (when they were raised 13-15¢), whereas comparable Western Hemisphere crudes are still above their prices then.

By and large, the ceiling on Middle East crude is determined more by competition from products prices in the Caribbean than by Western Hemisphere crudes.

The reason: The largest single big-volume outlet for Middle East crude is the great northwest European refining market. This area alone absorbs about one-half of all Middle East crude exports. And in northwest Europe, the effective ceiling on refinery sales prices is the cost of equivalent products delivered from the Caribbean, the chief alternate source. The refiner can sell for less (and often does), but obviously he can't sell for more.

Even if the European refiner could realize full Caribbean "parity," he couldn't make a profit at the recent Middle East crude postings.

When Middle East crude prices were raised in 1957, European refiners had no difficulty recovering the added cost, as Caribbean products prices had also soared sharply.

Since then, however, Caribbean prices have tumbled 35¢ a bbl. based on average European refinery yields of products—which are the ones that count in figuring the value of crudes in Europe. (Heavy fuel oil prices are a key factor; this product accounts for nearly 40% of European crude yields, gasoline only 26%.)

In fact, using European yields, Caribbean products are now actually some 3¢ per bbl. lower than they were before the 1957 crude advance (February, 1959, prices versus February, 1956).

* * *

While the Middle East crude cut will help alleviate this distress situation, this does not mean that refining and marketing will suddenly become highly profitable.

Even in 1956 and 1957—prior to the distress situation—refining and marketing profits were nominal in the Eastern Hemisphere. While breakdowns of earnings from different phases of operations are not published, it is clear from total earnings reports that profits outside of crude production are minor at best.

For instance, in 1956 the seven main international companies (Jersey, California Standard, Texaco, Socony, British Petroleum, Shell, and Gulf) reported total net profits of $2,562-million on their world-wide operations. Their combined crude production was 8,420,000 b/d. Their net earnings, thus, averaged only 83.4¢ per barrel of crude production. In 1957, the same figure came to 83.0¢.

If the profit on Middle East crude production was about 80¢ per bbl. (the governments got roughly 80¢ per bbl. under their 50-50 take), then it is clear that the companies realized practically no profits on refining, transportation, and marketing.

Thus, while the crude price cut should help pull refining and marketing out of the red, it will still leave the industry with very little profit in these branches of operations.

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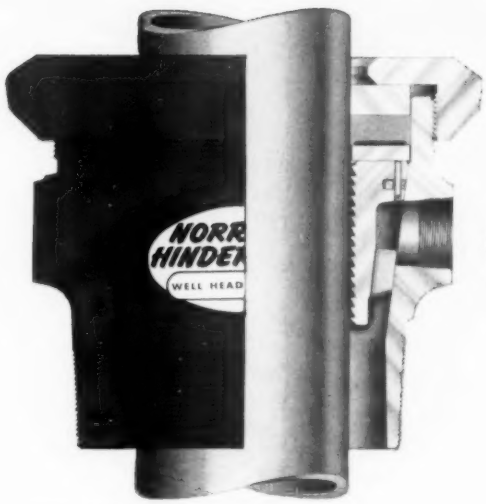

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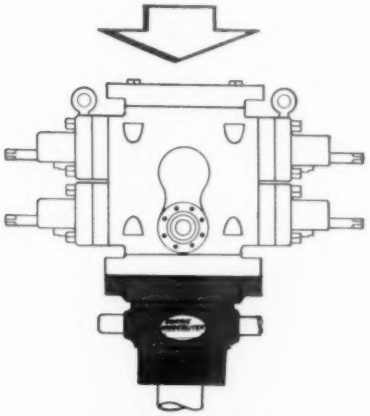

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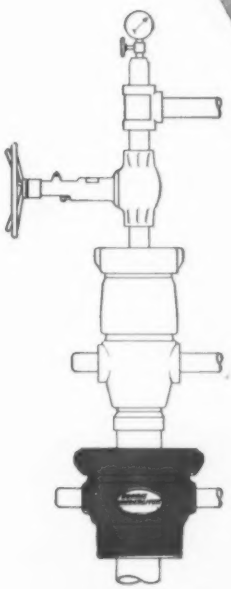

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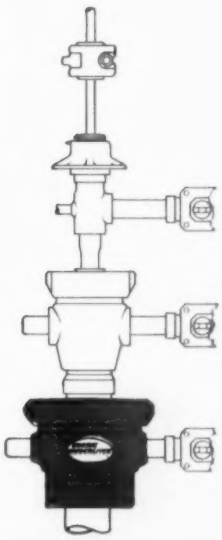

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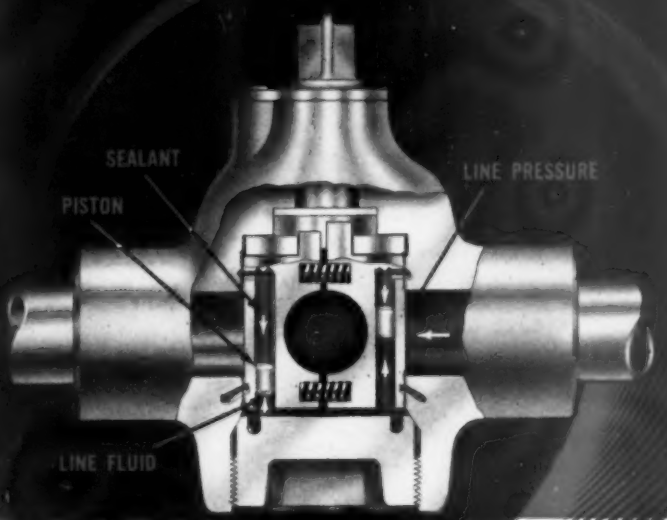

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It was put to use as an additive for oil-well cements for the first time by Halliburton Oil Well Cementing Co. in August, 1957, on a well in the Texas Panhandle.

During 1958, Halliburton used 2,837 tons of Gilsonite in oil-well cementing operations. The product, which is blended at bulk plants, is shipped in 100-lb. sacks.

This growth in use of and experience with Gilsonite cement will be discussed in detail by two Halliburton engineers at next week's meeting of the American Petroleum Institute's Southern District, in New Orleans.

Gilsonite cement has now been used in more than 200 field jobs, and has been tested extensively in the laboratory.

It has been used in most major oil-producing areas of the country, for many different cementing operations.

Primary domestic application, however, has been in the Kansas-Oklahoma-Texas Panhandle area (74 jobs), the Gulf Coast (52 jobs) and West Texas (28 jobs). It has also been used in offshore operations, and is now being exported for overseas use.

Gilsonite cement has been field-proved for high-fill-up cementing, for multiple-stage cementing, for plug-back operations for lost circulation, and for setting production liners in gas wells with weak formations.

In one West Texas field, for example, considerable trouble is encountered when setting production pipe because of two very weak formations. Prior to introduction of Gilsonite, various types of bridging materials and lightweight slurries had been tried, with at least two or three stages being required.

Five single-stage jobs have been completed successfully with Gilsonite. Temperature surveys indicated fill-up of 90% or better on each of these jobs. In previous jobs, there was a fluctuation of pressure while pumping, indicating a breakdown of the weak formations while cement was being circulated.

With Gilsonite, pressure showed a steady build-up from the time the cement reached the formation until the top plug was landed.

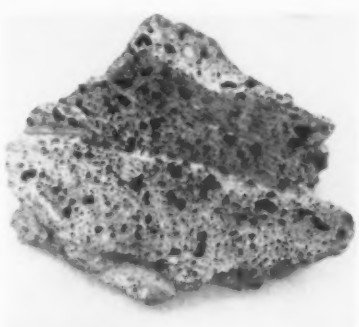
Gilsonite was first evaluated in the laboratory as a density-reducing additive for cement slurries because of its low specific gravity (1.07).

The lab tests were aimed at determining optimum particle size for such use. Three primary objectives were set: (1) to determine minimum particle size to provide excellent control of lost-circulation zones; (2) to determine maximum size to permit pumping through downhole cementing equipment; and (3) to determine proper particle-size distribution to carry out the first two objectives and to allow slurry preparation with a minimum amount of mixing water.

Once the physical makeup of the cement additive was determined, further lab tests were made of its various properties.

Here are the properties of the material finally selected: bulk density, 50 lb. per cu. ft.; water requirement, approximately 2 gal. per bulk cu. ft.; and melting point, 385F to 525F.

Halliburton reports that this made up a superior lightweight slurry, because the light weight is a function of the Gilsonite's low specific gravity, rather than of the addition of a large volume of mixing water.



EVEN DISTRIBUTION of Gilsonite cement is evident in this sample.

Higher compressive strengths also are generally attainable when solid particles are added to a slurry than when excessive quantities of water are used. The Gilsonite adds volume, not weight, to the slurry.

Gilsonite neither accelerates nor retards the setting times of the various slurry compositions with which it can be used.

Thickening-time tests on various types of slurries also indicate that Gilsonite does not significantly change the pumping time of portland or Pozmix cement.

Field results to date indicate that a low-density slurry Gilsonite gives excellent results in areas of incompetent formations and other types of lost-circulation zones.

The field jobs generally show that fill-up of 80% to 90% can be obtained in areas where only 50% to 60% fill-up was possible with other types of slurries.

It has also been found that 25 lb. to 50 lb. of Gilsonite per sack of cementitious material will generally be an optimum amount for controlling lost-circulation zones.

Gilsonite is milled and graded to correct particle size for this particular field use, and is generally used with portland cement, with or without bentonite, Pozmix, or Pozmix 140. Only one grade (particle size) is being used in current oil-well cementing jobs by Halliburton.

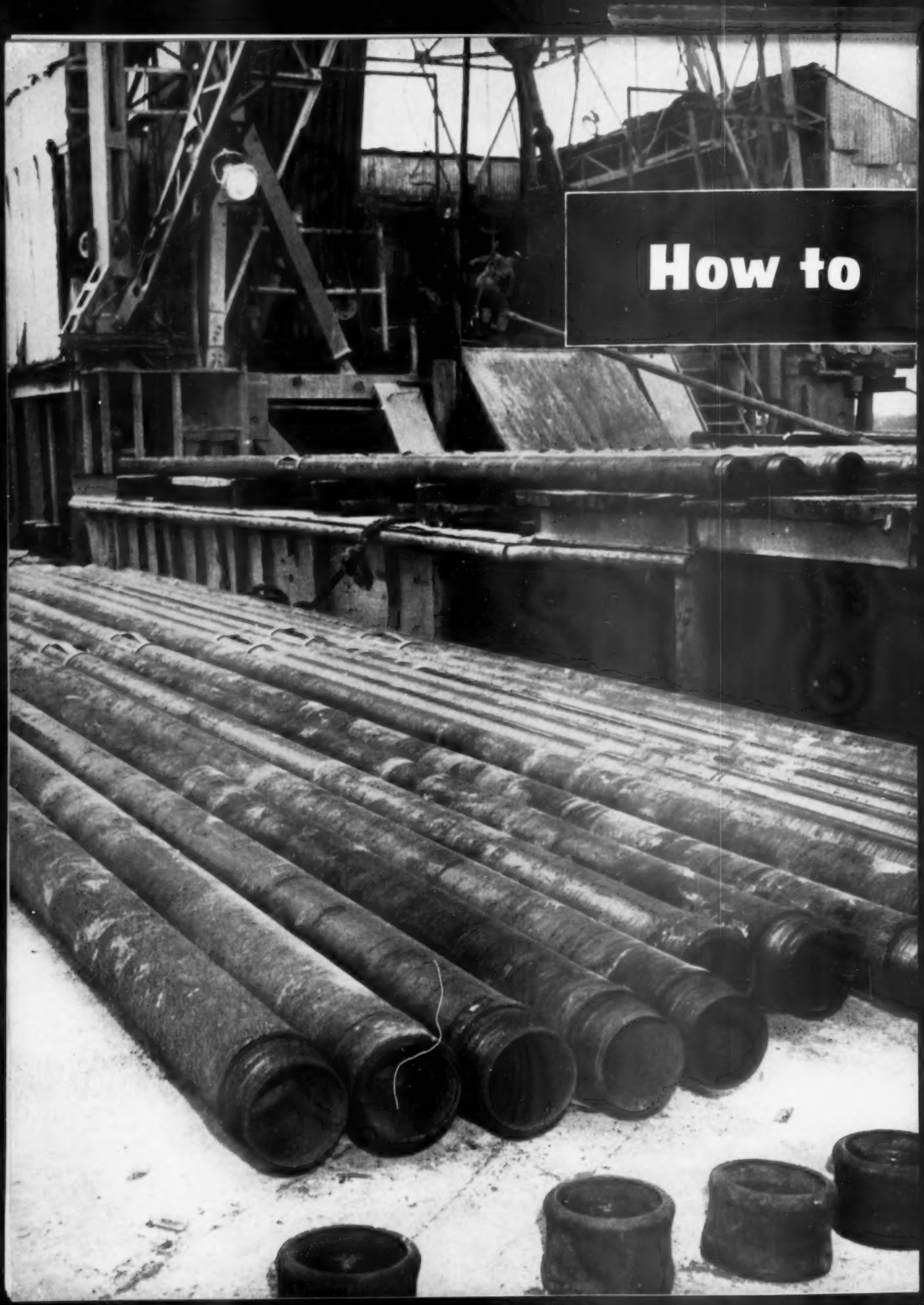
The field tests also have pointed up other advantages of the lightweight cementing slurry.

In most areas where Gilsonite has been used, it appears that its scouring action is good in removing drilling fluid and filter cake from the hole. This results in a better cementing job without the necessity of block squeezing.

Both laboratory and field data show that Gilsonite is compatible with existing cementing compositions and additives. The only precautions necessary are minimal use of high-water ratio additives, which may materially reduce the strength and durability of the Gilsonite blends.

Accelerators, retarders, and low-water-loss additives are recommended when specific well conditions warrant, reports Halliburton.

Compressive strength is high, even at low temperatures, the tests show;


How to

Case With Confidence

J&L Extreme Line Casing lets you case your deeper wells with confidence. Extreme Line is the one casing designed for use under the most severe and variable conditions.

Extreme Line features include high joint strength, positive resistance to leakage, reduced outside diameter and elimination of couplings. Faster running speeds result from modern thread and joint design. External streamlining and high resistance to thread damage add to the qualities of this proven product.

J&L Extreme Line is available in grades J-55, N-80 and P-110. Quality controlled manufacturing of all J&L tubular products is your assurance of superior performance.

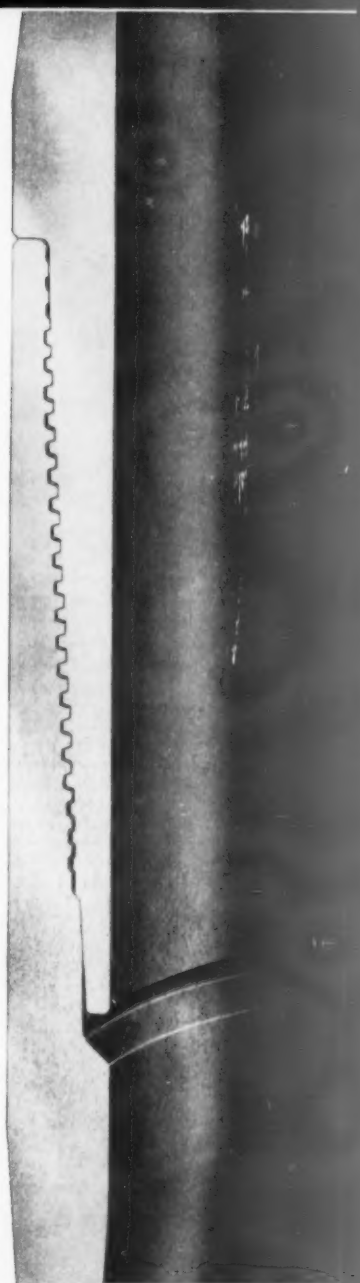
Be sure you have the latest information on **J&L Extreme Line Casing,** which is manufactured under license from The National Supply Company.

Call your local Jones & Laughlin Supply Division store or office.

Jones & Laughlin

SUPPLY DIVISION – Tulsa

If it's sold by J&L....
It's the best available



Extreme Line Joint

Tips on Valves for Service Companies..

Ken Massey, Cardinal station manager, supervising sand fracturing job in west Texas. Note Rockwell-built Mudwonder valves on frac-head in background.

We maintain sand fracturing fluid pressure with Mudwonder Valves!

by Kenneth Massey,
Odessa Station Manager
Cardinal Chemical Company

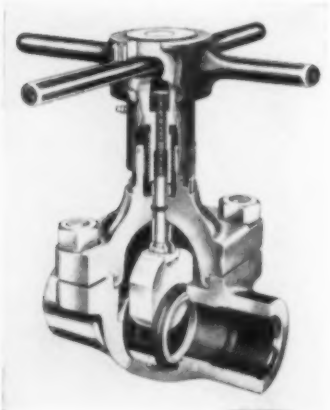
WE fracture oil wells. It's our job to get the maximum number of barrels pumped in the shortest possible time. That's why we use the best, most dependable equipment available—and drive it hard. When we finish pumping the sand fracturing fluid in under high pressure and close the well-head valves, we've got to be *sure* they don't leak. For two years now, we haven't had to worry. We find that well pressure never bleeds off when our Mudwonder valves are closed. There's no need to bump them shut or use a "cheater" to get drop-tight shut-off.

We now have 40 two-inch Mudwonders and several three-inchers. You might think maintenance would be a headache—but our Mudwonders don't seem to need much in the way of repairs. The only part that wears to any extent is the seat insert, which we can replace in a couple of minutes between jobs.

At the present time, we're using Mudwonders at all of our stations—Odessa and Levelland, Texas, and at Hobbs, New Mexico. We're thoroughly sold. Mudwonder valves are doing a great job for us, both on sand fracturing and in acidizing.

Mudwonder valves are built in 2", 3" and 4" sizes; with screw or flange ends; for 2000 psi WP (4000 psi test) and 3000 psi WP (6000 psi test) service. See your favorite oil field supply store, or write Edward Valves, Inc., East Chicago, Indiana, subsidiary of Rockwell Manufacturing Company.

Mudwonder cut-away view shows the one-piece seat insert, with Buna-N molded integrally over steel wear rings; chromed gate with "T" slot connection; separated stainless stem and double thread construction.



it may, however, vary slightly with different brands of cement.

Because of its good bridging properties, however, certain precautions are recommended in its use.

Where weak formations exist, the bridging properties of Gilsonite will allow use of 12.5 lb. to 13.5 lb. per gal. slurry weights for good cementing results.

Because of its low specific gravity, however, Gilsonite may float and accumulate in a slurry of low viscosity. Water, therefore, should not be used ahead of the slurry because of potential dilution and viscosity reduction.

The preferred fluid ahead of Gilsonite, according to Halliburton, would be a mixture of bentonite and water (300 lb. per 15 bbl.). The slurry should also be mixed at the recommended weight throughout the job.

Because of Gilsonite's scouring action in mud removal, and the possibility of premature bridging, it is also felt that a bottom cementing plug should not be necessary, and that the use of wall-cleaning devices should be held to a minimum to reduce possible obstructions in the annulus.

Gilsonite also is being used as a lost-circulation additive for mud.

There is, however, some disagreement on its value for drilling fluids.

One major mud company reports that one of its subsidiaries has tried it, but "with no favorable results."

A company spokesman says, "About the only way I can see that it could be used as a lost-circulation material is if there is no oil, and very low temperatures."

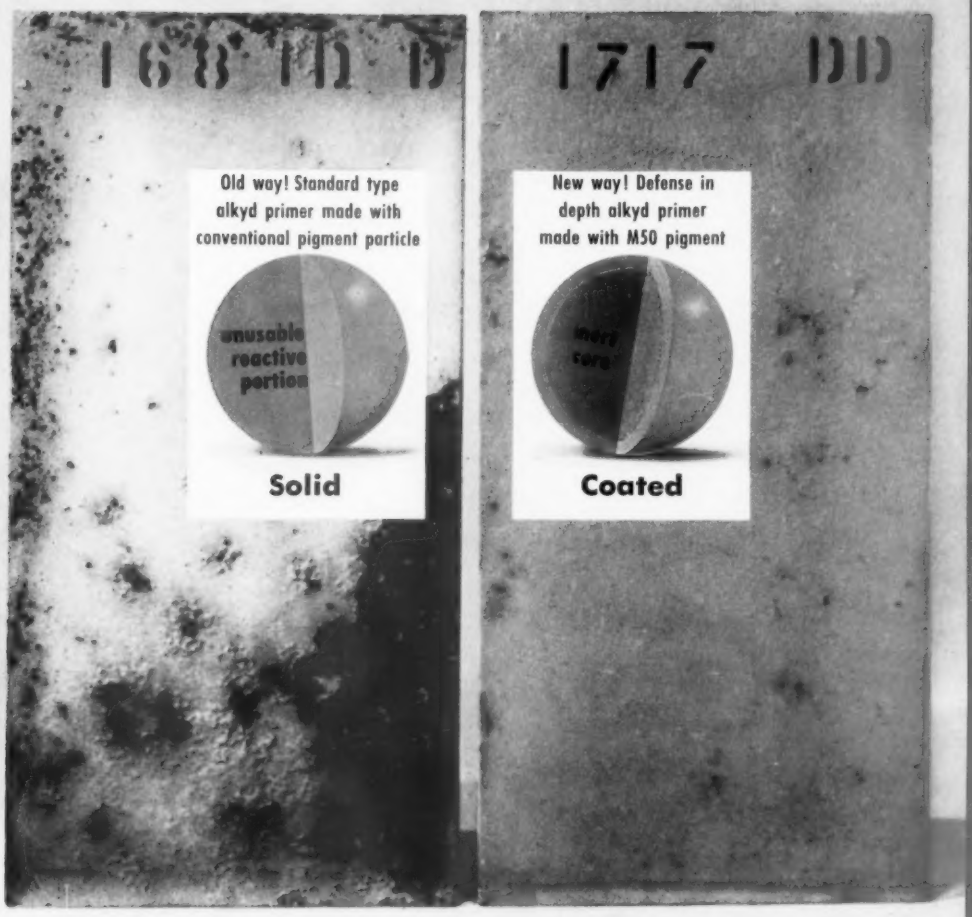
An official of Standard Gilsonite Co. says, on the other hand, that the company's Gilsonite mud product, among other things, (1) will stop fluid loss into a formation by sealing normal, porous, and fractured borehole walls; (2) will prevent reactions between drilling mud and formation material by forming a water-impervious seal between the drilling-fluid column and the formation penetrated; and (3) can protect the pay zone from drilling-fluid contamination by creating an impervious seal which can be removed by crude either emerging from the pay zone or introduced into the hole after completion.

It seems apparent that only further field use can resolve the conflicting views held on this use of Gilsonite.

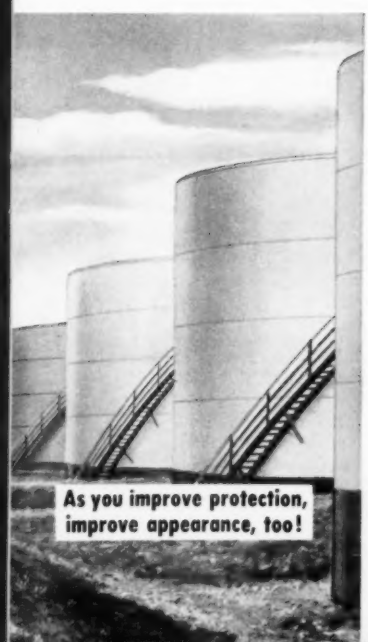
Virtually all of the Gilsonite now being mined commercially comes from extensive deposits in northeast Utah.

The substance is deposited in roughly parallel lines running in a northwest to a southeast direction. It occurs in vertical fissures, rather than

Never before such durable tank protection


Old way! Standard type alkyd primer made with conventional pigment particle
unusable reactive portion
Solid
New way! Defense in depth alkyd primer made with M50 pigment
more core
Coated

Proof tank paints with M50® pigment form rust-inhibitive films of outstanding strength and durability



Test panels like these *prove* what paints can do. And these two make it plain that paints containing *M50* basic lead silico chromate — a new National Lead rust-inhibitive pigment ... form outstandingly strong and durable protective films.

Excepting the pigment, both primers shown on the test panels contain the same ingredients. Both are applied (2.0 mils, dry) on rusted and mill-scaled steel (to increase test's severity). Both have been exposed 12 months in industrial atmosphere (Perth Amboy, N. J.) and 12 months in normal atmosphere (Sayville, L. I.) at 45° South. You can see the effect.

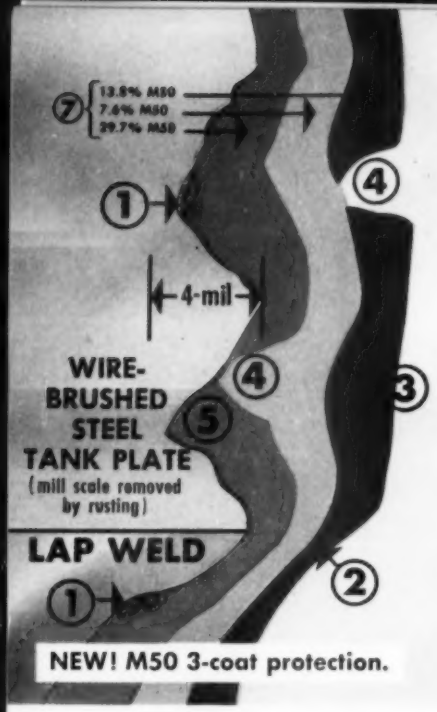
A striking difference! Yet film strengthening proves to be only one of many improvements that *M50* pigment makes in metal protective paints for steel tanks and structures. Now — with new *M50* pigment — your regular paint suppliers can provide metal protective paints with outstanding advantages:

- Weather-resistant anti-corrosive primers.
- Intermediate and finish paints *with* exceptional rust inhibition but *without* bilging hazard in sulfur-laden atmospheres.
- Finish paints in a wide range of decorative colors that don't fade or wash out.
- Alkyd-type conventional and heavy-coat paints with outstanding durability, package stability and sprayability.

What makes the difference? Basically the differences that make a difference in *M50* pigmented paints are inherent in the unique *M50* coated pigment particle itself (idealized particle shown above.) See, on the next page, the extra protections the *M50* particle provides in the dried film. See, too, how you can get the benefits of these new, much more durable, anti-corrosive paints.

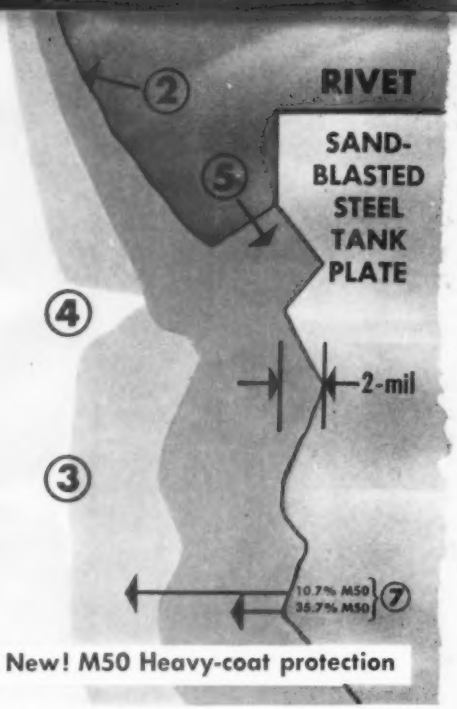
M50 pigment is a product of National Lead Company

General Offices: 111 Broadway • New York 6, N. Y.



NEW! M50 3-coat protection.

1. **Pockets of rust prove less harmful** on steel surfaces painted with conventional *M50* paints. Vehicles penetrate and isolate existing rust. *M50* particles stop rusting action.
2. **Where paint film lies thin** over tiny surface projections and sharp structural edges, the *rust-inhibitive* pigment content in all coats of *M50* paints provides extra protection.
3. **Just-right flow characteristics of** package-stable *M50* paints aid leveling on rough steel surfaces, promote smoothness, good appearance.
4. **Inevitable "holidays" in film** do not destroy protection. Again, *all M50* coats have both rust inhibition *and* weather resistance.
5. ***M50* paints "wet" well,** penetrate pits and crevices, carry *M50* protection to every part of these danger spots.
6. **Lightweight *M50* particle** aids formulation of new type heavy-coat paints with *uniform* rust inhibition throughout the film and low sag characteristics.
7. **Every coat can have rust inhibition** — not just the primer. Note percentages of *M50* in dry films. What's more, for equal weights of corrosion-inhibitive pigment, *M50* primers contain 40-60% more corrosion inhibition by volume than non-*M50* primers.



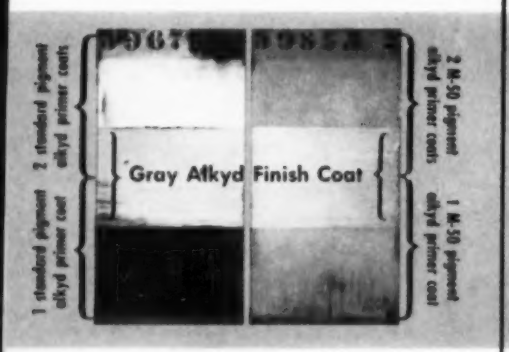
New! M50 Heavy-coat protection

Sections through M50 Defense in Depth films show dramatic extra protection these new tank paints provide

Information on the preceding page proves that *M50* pigment paints form stronger protective films than anti-corrosive paints made with other rust-inhibiting pigments. The sections above show some of the ways in which these new paints perform better in the dry film. Below you will see *proof* that *M50* metal protective paints don't bilge, are unique for color stability and the color range in which they can be made.

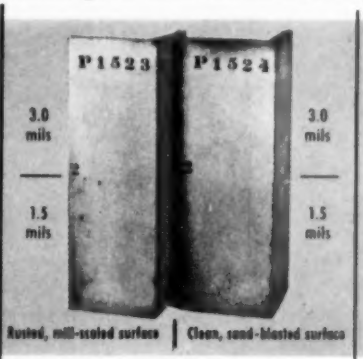
Hold the *M50* pigment particle itself responsible for all these improvements . . . *Basic lead chromate* is known for exceptional rust-inhibiting action. In the *M50* particle, this reactive business portion of the particle is coated on an inert core . . . where *all of it is available* to react. The coating is *fused* on — shows superior resistance to chalking, erosion, chemical action. Unusual tintability is due to the geometric configuration of the coated silica particle.

Why M50 Defense in Depth paints give anti-corrosion beyond all former concepts


2 standard pigment alkyd primer coats
2 M-50 pigment alkyd primer coats
Gray Alkyd Finish Coat
1 standard pigment alkyd primer coat
1 M-50 pigment alkyd primer coat

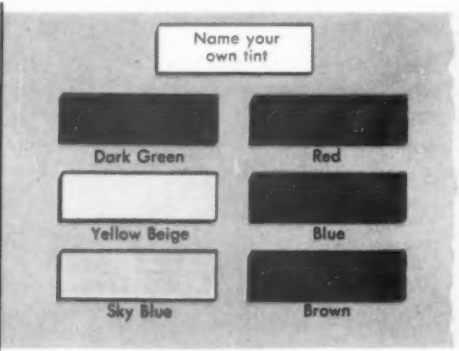
Exposed 9 years, 45°S. Each coat 1.5 mils

Proved corrosion and weather resistance



Exposed 4 years adjacent to refinery

Proved anti-bilging performance



Available in conventional and heavy-coat paints

Proved stability in wide range of colors

Are you concerned with tank or structure maintenance painting in your firm? If so, you are invited: (1) to visit National Lead's Sayville, L.I. test station, where you will see the results of the 20 years research that lies behind the *M50* pigment particle and the more than 10 years of exposure testing that lies behind *M50* pigment Defense in Depth paints; (2) to send coupon below for National Lead booklet, "Defense in Depth" and typical *M50* tank paint specifications.

Next time you purchase, specify *M50* pigment paints. Any paint manufacturer can supply you.

M50 Defense in Depth

National Lead Company,
111 Broadway, New York 6, N. Y.

Gentlemen: Please send me the "Defense in Depth" booklet together with typical tank paint formulas and color chips that I can use in specifying M50-type tank paints.

Name_____ Title_____

Firm or Dept._____

Address_____

City_____ State_____

in beds, pools, or lakes, as do bitumens and asphalts. It is mined by several companies, largest of which are American Gilsonite Co. and Standard (PW—Aug.2'57,p36).

Gilsonite is found in veins which vary in width from a fraction of an inch to 18 ft., and in length from a few hundred feet to 8 mi. Major veins are 100-200 ft. or even more in thickness.

The main veins are almost pure Gilsonite, with adjacent rocks usually impregnated to a depth of several inches.

Mining of Gilsonite is almost exclusively by high-pressure hydraulic guns or nozzles. Surface, or open-pit, mining is the norm. Gilsonite dust has an explosive quality, and several explosions resulted in earlier days when the asphaltite was mined by more conventional methods.

Drilling Mud Used To Fight Forest Fire

An Alberta government agency has come up with an odd new use for drilling mud: fighting forest fires.

This unsuspected talent of the mud was disclosed in the Alberta legislature by Lands & Forests Minister Norman Willmore, in a report on the department's forest protection program.

Results of a spur-of-the-moment decision to use the drilling mud on a hot, stubborn fire indicate that it is effective.

Willmore said that, last year, the department was fighting an unusually hot and stubborn forest fire in a forestry region about 25 mi. northeast of Edson, Alberta, when the decision was made to try the drilling mud.

He said that the mud, presumably provided by an oil company in the area, was sprayed on the fire from planes.

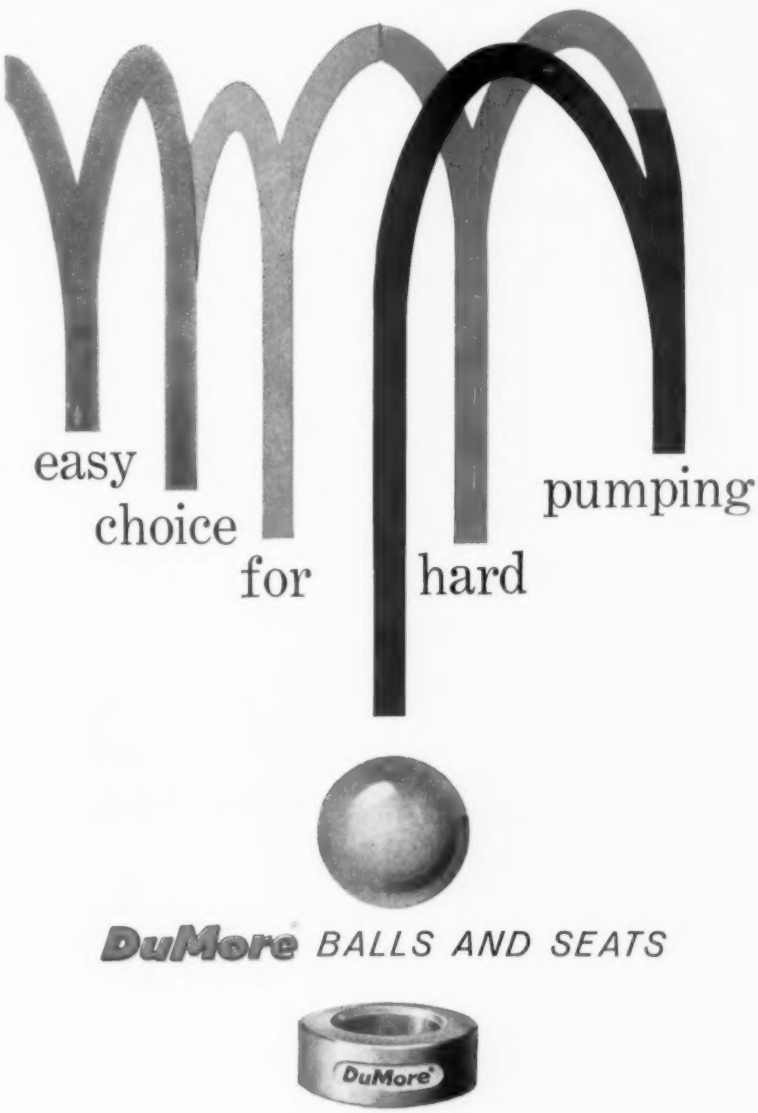
And from all appearances, says Willmore, the drilling mud was just as effective as the commonly-used chemical sprays, and the cost was less.

No figures are available as to how much of a saving drilling mud might present in fighting fires.

A spokesman for a drilling mud company in Calgary says that, although bentonite is not the most common clay, it is cheap when compared with chemicals, and can be sprayed from the air in the form of dust.

Willmore says that since the mud has so far been used for the purpose only once, it will have to undergo "several more tests" to prove its merits over other methods of fighting forest fires.

Hard pumping, or corrosive or abrasive fluids, often result in frequent, expensive pulling jobs due to valve failures. If you are having this problem, the solution lies in genuine DuMore Balls and Seats. DuMore, a special composition of chromium, cobalt, and tungsten, will take any kind of punishment because of its exceptional resistance to impact and pressure. Every DuMore Ball and Seat is manufactured to exact A.P.I. specifications. Each ball is precision ground to a sphericity of .0001". Each seat is individually ground and mated to its ball, vacuum tested, and individually packaged to assure perfectly-matched sets. Ask your supply store about DuMore. They'll tell you it's the best ball and seat you can run.



" . . . advanced technology and methods"

"In an industry such as ours, an industry whose accomplishments are little short of phenomenal, it is difficult to praise any one segment without deep consideration.

"Great contributions have been made by all elements. Cooperation between operating companies, manufacturers, drilling contractors, and service and supply companies has made possible the growth and progress our industry enjoys.

"Service companies, for instance, have given us advanced technology and methods for finding and producing oil and gas. These services are available when and where they are needed, at any time day or night, in any weather.

"Behind each drilling rig, each refinery, each gas plant or pipe line operation stands the manufacturer, the supplier and the service man. They provide engineering, research, products and services to keep the industry humming.

"As I said, it's hard to praise just one segment of the industry, but one thing is certain, all our jobs have been made easier and better because of the companies and men who give the service."

J. L. LATIMER,
President,
Magnolia Petroleum Company

P.E.S.A.*

* PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

PROUD TO BE PART OF A PIONEERING INDUSTRY

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

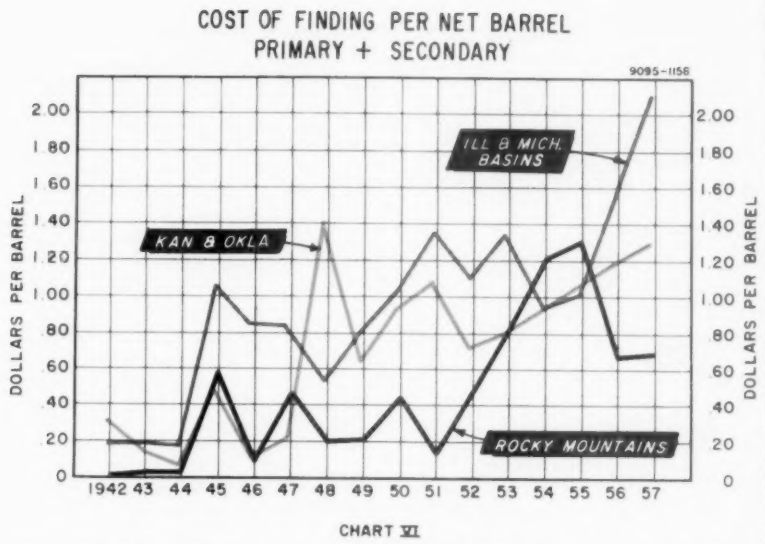


CHART VI

COST COMPARISON shows Rockies are cheapest oil-finding area, as economist tells . . .

How to Figure Oil-Finding Costs

A Carter Oil Co. economist has spelled out a method which he feels may answer a nagging oil industry question: How much does it cost to find petroleum in a given area?

Robert E. Megill, senior economist with Carter, presented the details of the cost-finding method at this week's annual meeting of the American Assn. of Petroleum Geologists, in Dallas.

The method outlined has been used by Carter's economics department for the past several years, evidently with good results. "Our purpose has been to establish costs of finding and trends in finding costs," Megill said.

The Carter method differs from usual cost-finding methods in that it includes an estimate of future reserve additions or corrections.

Megill said many oil men compute costs of finding oil by using American Petroleum Institute reserve additions as indicative of barrels found.

"If a very long period is considered," Megill said, "this is reasonably accurate. But the disadvantages on a short-range basis are many."

For example, he noted, reserve additions resulting from waterflood projects in old reservoirs are not a result of current exploration; they should be credited to earlier exploration programs. Such waterflood reserve additions cannot be segregated when using API data.

Similarly, major revisions (up or down) in old fields are not a result of current exploration efforts. These changes also cannot be isolated from API data, Megill said. He added:

"The results of current exploration programs can be determined only by considering the new reservoirs found during the period."

Finding expenses should be related to the number of barrels of oil found, he said. That's why it's necessary to include future reserve additions in determining the proper number of barrels to relate to current costs, Megill explained.

The Carter method consists of three separate calculations, which adjust barrels found and developed to a final probable basis.

The three points, said Megill, are:

(1) All petroleum reservoirs are separated by year of discovery.

(2) Current estimates of reserves are tabulated by year of discovery.

(3) Current estimates are statistically corrected for future reserve additions, both primary and secondary.

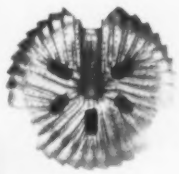
The technique for estimating the cost of finding petroleum in a given area hinges, basically, on applying dollar costs to physical factors that can be estimated or measured.

To do this, said Megill, some basic exploration facts must be assembled. These include the number of employed geologists; the amount of geophysical work performed; the number of employed scouts; the undeveloped acreage holdings; and the number and average depth of dry holes.

Geological costs can be calculated by multiplying the number of employed geologists by the cost per geologist per year to arrive at total geological costs. Total seismograph

HYCALOG
V-DOOR
DIAMOND DRILL BITS
Patent applied for
HYCALOG

ONE BIT DRILLS 1206 FEET IN 15,000 FOOT HOLE



In a South Louisiana well, recently completed, a single $5\frac{15}{16}$" Hycalog V-Door diamond drill bit made the run through sand and shale from 14,324 feet to 15,530 feet. No trips out of the hole were necessary for bit changes and the run was completed in 247 hours at an average drilling rate of 4.8 feet per hour.

When pulled, after reaching the total depth, the bit was found to be in excellent condition and *capable of making a lot more hole.*

This is just one of a number of such records set by Hycalog V-Door bits. Why not let V-Doors set a record on your next drilling program? *And ask us also about Hycalog* Gas Chronofrac *well logging services.*

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505 AERO DRIVE
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BRANCH OFFICES IN PRINCIPAL OIL PRODUCING AREAS

DIAMOND BITS DIAMOND CORING
WELL LOGGING CORE ANALYSIS

Congrats and $25 to Mr. D. J. SUGGS, Republic Natural Gas Co., Tipton Bldg., Pauls Valley, Okla., for this quip.

Joe Roughneck is top kick of the industry . . and plenty tough in his pipe demands.

He likes the plus factors he gets in using Lone Star electric weld pipe: convenient source of dependable supply, overnight delivery and rigid quality control through exacting multiple tests.

Sound, strong, lasting pipe you can depend upon: API casing, tubing and line pipe from Lone Star.

Neighbor, wherever you are, specify Lone Star and we both get a good deal.

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cost can be estimated by multiplying the cost per crew month by the number of crew months worked. Scouting costs are estimated in the same manner as geological costs.

The cost of dry holes can be estimated by use of drilling-cost data published by the Joint Association Survey.

Acreage holdings have been published by the Independent Petroleum Assn. of America, Megill said. From these holdings, the number of acres acquired and leases are estimated.

Surrendered-lease cost, annual rentals, and leasing costs are determined by multiplying cost-per-acre factors by the appropriate acreage.

Carter's final cost figure includes money spent looking for gas, but there is no breakdown.

Megill noted that there is no general agreement in the petroleum industry as to how costs for gas exploration should be allocated.

"Those interested in correcting these costs can apply their own allocation techniques to the total dollars spent," the Carter economist said.

Such a correction, he added, obviously is more important in some areas than others.

Carter's analyses of finding costs in three major areas—Kansas-Oklahoma, the Illinois-Michigan basins, and the Rocky Mountain area—show that the Rocky Mountain area presently has the lowest finding cost (chart, page 35).

Finding costs were about $2 per net bbl. in 1957 for the Illinois-Michigan basins; $1.30 in Kansas and Oklahoma; and only 70¢ in the Rocky Mountains, Megill said.

He added that the petroleum industry in the Rocky Mountain area is currently spending $60-million a year on geology and geophysics. This comes out to 20% of the cost of finding.

Acreage costs amount to about 40% of the cost of finding, and now total $160-million per year. Much of this is in rental costs, which are increasing as each area is leased the second time, he said.

Dry-hole costs amounted to $120-million in 1955, 1956, and 1957—almost 40% of the total finding cost which reached a peak of about $350-million in 1957. This is a cost per wildcat of almost $200,000, or at a 7½% success rate, $2.5-million per successful wildcat.

These dollar costs, when compared with the net barrels of oil found, provide the per-bbl. cost. These show, said Megill, that finding costs per bbl. in the Rocky Mountain area are among the lowest in the U. S., but

have increased since 1951, with a peak in costs coming in 1954 and 1955.

The money spent in any one year for oil and gas exploration may have only an indirect relationship to barrels found, the economist said.

Some leases bought currently will be drilled in subsequent years, and some of the prospects uncovered by geologists and geophysicists will be drilled later, too, he noted.

By considering a 16-year trend, however, the finding-cost trend can be established, Megill said.

By making additional calculations of development and operating costs, a comparison can be made between replacement cost per bbl. and the average crude price in the area.

The fact that there is a relationship between replacement cost and crude price, Megill said, indicates that either replacement cost is restricted by crude price, or that crude price is pressured upward by replacement cost.

Probably, added Megill, neither is completely correct.

Crude prices also are affected by such factors as the price of competing crudes, the prices of petroleum products made, and the price for costs of competing energy sources, the Carter economist said.

"The cost of any commodity must eventually be reflected in its selling price," he continued. "In such instances, the oil industry has only one alternative—lower its costs.

"This is particularly important now, because the cost per bbl. of finding oil is rising more rapidly than development and operating costs per bbl.

"Furthermore, it will continue to do so in the future."

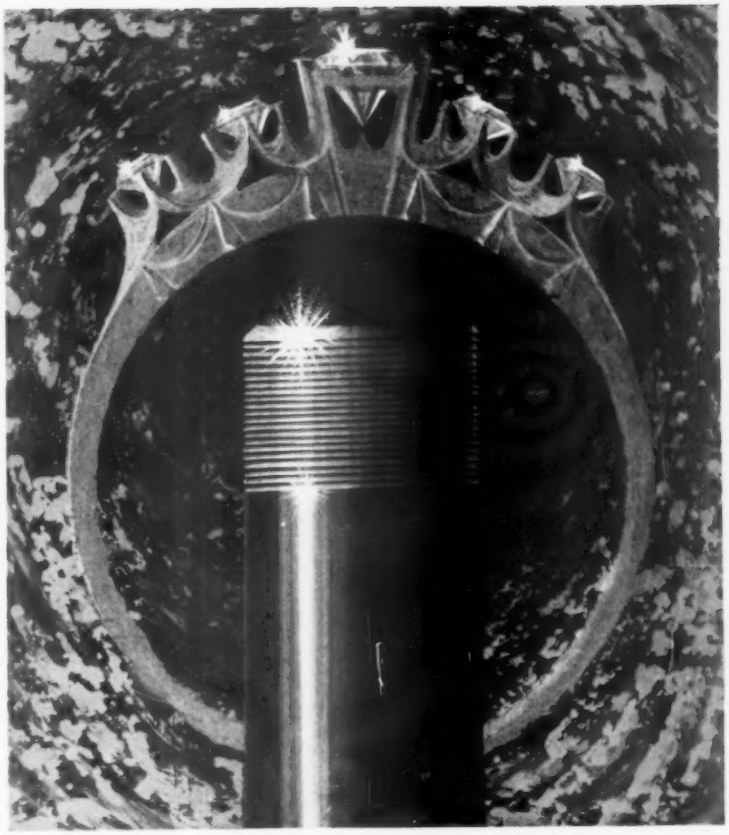
A study of money spent against money taken in shows that the oil industry has accumulated a net deficit of $1-billion in the Rocky Mountain area since 1950.

This deficit, Megill said, emphasizes the huge cash requirements of the petroleum industry.

However, he added, sufficient reserves have been added to the area (5.1-billion bbl.) to more than offset this deficit from future profits. "But it will be some time before the deficit is erased."

Megill warned that much more data needs to be published, and preferably on an area basis. He said:

"If the U. S. petroleum industry is to survive the intense competition with other crude suppliers of the world, it must become more familiar with its costs; it must find where the best opportunities lie for reasonable profit.



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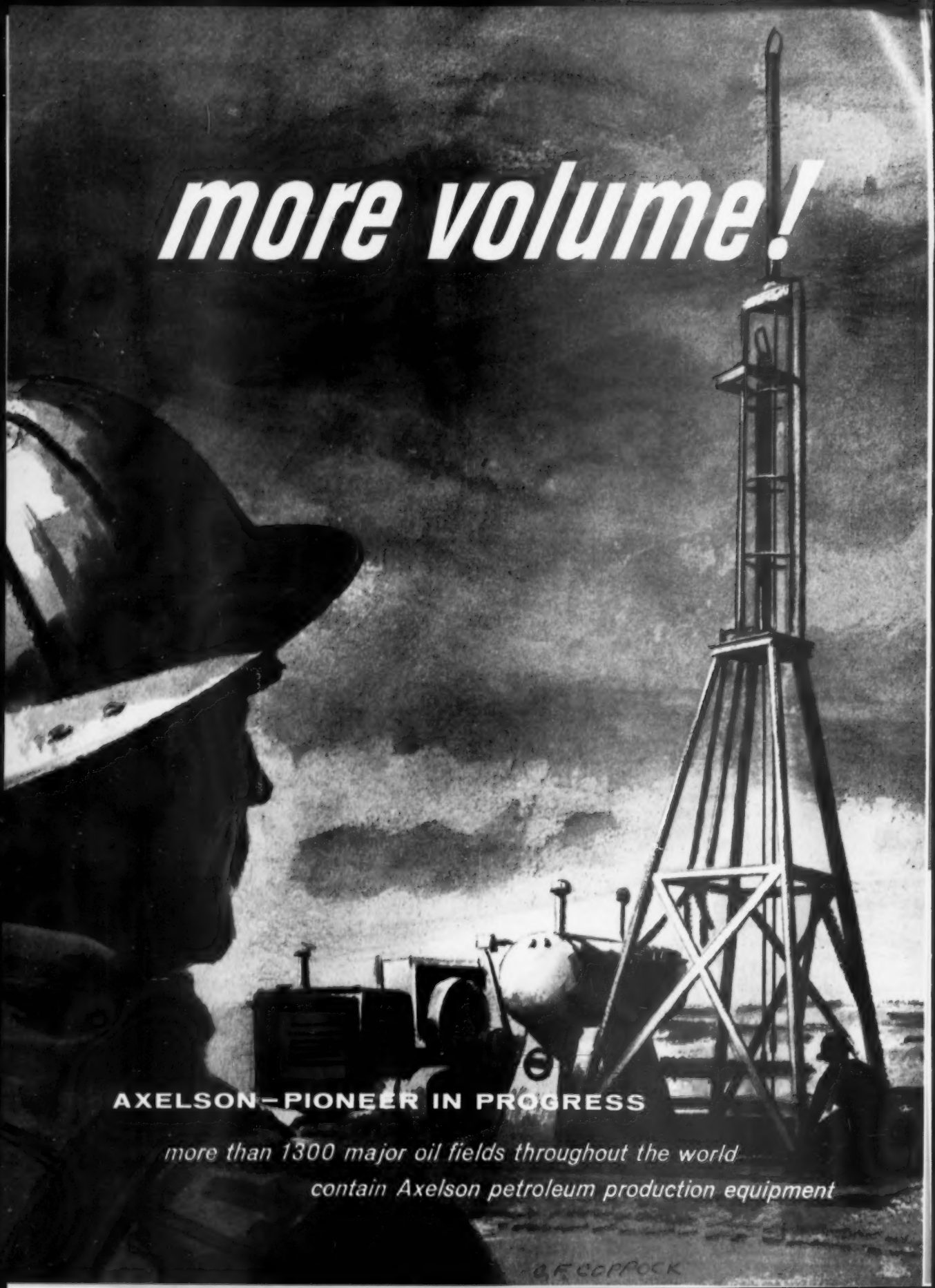
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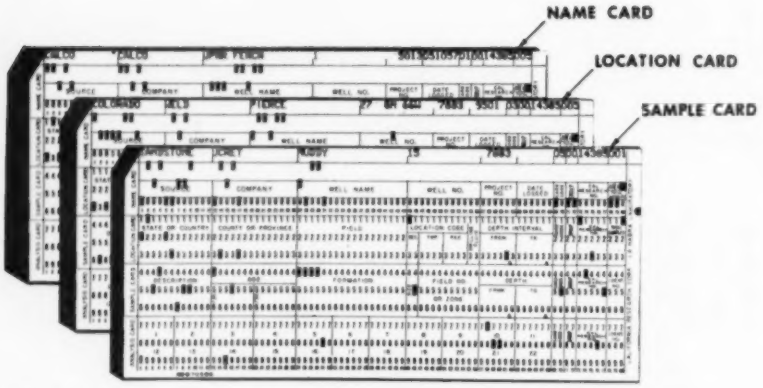

WELL DATA is recorded on three types of punchcards as California Research Corp.'s . . .

Sample-Data Filing Goes Modern

An electronic punchcard system for compact storage and quick location of geological sample data is boosting the efficiency of California Research Corp.'s La Habra (Calif.) laboratory.

The company's L. C. Bonham explains that the system utilizes International Business Machines punchcards and a catalog containing data culled from the cards.

According to Bonham, the system provides a rapid, economic method for:

- Identifying, storing, and retrieving samples.
- Recording field geological and laboratory analytical data.
- Retrieving samples or data by any recorded item: that is, by age, formation, lithology, or the like.
- Providing cumulative catalogs of samples and data for distribution to individuals or groups anywhere in the company structure.
- Handling of analytical data by computing machines.
- Adding to, revising, and modifying the accumulated data.

CRC, as the research subsidiary of Standard Oil Co. of California, performs research and technical services for the parent corporation and its operating subsidiaries.

Since many engineers, geologists, and others untrained in punchboard techniques use the data, the new system was designed to have a minimum of coding, so that general use would be possible without special training.

For example, a well name or formation name is spelled out, rather than being recorded as two or three digits or letters.

This requires more space on the punched cards for each item of information, necessitating use of several cards for each sample.

The limited coding also reduces the efficiency of machine-card sorting. But this is not a serious problem, Bonham says, because of the manner in which the cards are used.

"They simply provide maneuverable storage," adds Bonham. "If necessary, the card deck can be sorted to find a specific item, but normally it is sorted only to print new catalogs.

Most searches are made in the printed catalogs, rather than in the card decks.

Data is tabulated first in a sample log book, then key-punched on special IBM cards. Three types of cards are used.

Here's how the system works:

One name card, one location card, and a separate card for each individual sample (picture) are required to record the basic data for a single set of samples.

The information on the name card is repeated on the location card, all sample cards, and any cards on which analytical data are recorded. This ties together the multiple cards required.

These three types of cards store the basic sample information. At periodic intervals, the card deck is arranged in sequential order, and complete cross-reference catalogs are printed.

The deck is then sorted, and cumulative catalogs are printed to provide alphabetical listings by source, company, well name, state, county, field description, and formation, plus sequential listings by project number, date, age, and depth.

Various types of analytical data are recorded on additional cards, which are keyed to the basic sample information by the CRC number and identification number.

The research company has found that the new system permits use of samples and data from completed research projects in many subsequent, often unrelated, investigations.

The new punchcard system replaces an accession number system used previously, but found increasingly inadequate as the organization expanded and the number of samples and amount of information grew. The old system also was not suited to search by formation, age, etc.

Paraffin Troubles? Use Candy Balls!

"Jawbreaker" candy balls—long associated with cheek-filled boys—are being put to a new use in the oil industry—dislodging paraffin from crude lines.

Julius Glenney, a Texas Co. engineer, recently obtained a patent for this unusual use of the candy balls.

In his patent application, Glenney says the jawbreakers simply are dropped down the lines used to carry crude under pressure to operate downhole hydraulic pumps.

Ordinarily, it's necessary to pull the pipes to clean the paraffin and other clogging agents. This necessitates shutting down the well.

The jawbreakers, however, clean the line down to the hydraulic pump.

Glenney, inventor of the method, claims that jawbreakers don't dissolve as fast as naphthalene moth balls, which have been tried, and that they are cheaper—costing less than a penny each. What's more, he says jawbreakers don't damage the hydraulic fluid.

The jawbreakers—made of sugar, corn syrup, artificial flavoring and coloring—fit nicely into the usual 1-in. pipe used to carry the power crude down to the pump.

By the time they have reached the ¾-in. pipe at the bottom, they have slimmed down proportionately. What's left of the candy ball is caught in a screen at the pump, where it dissolves.

Glenney says he prefers jawbreakers for this use, but that sour balls or other hard candies could be used if they are comparable in hardness and other qualities possessed by the jawbreakers.

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What's New / IN EXPLORATION, DRILLING, PRODUCTION

Government Withdraws Wilmington Field Suit

The Federal government has stopped its court action threatening to shut down the huge Wilmington field, Long Beach, Calif.

Federal Judge Harry C. Westover removed the suit from the court calendar at the request of William P. Gray, special assistant to the attorney general.

Last August, at the Navy's request, the Justice Dept. filed the suit asking for either compulsory repressuring or shutting-in of the field because of the subsidence problem in the Long Beach Naval Shipyard area.

Gray said the suit was withdrawn because operators in the area have already started a repressuring program that appears to be halting the subsidence.

He warned, however, that the suit could be reopened any time, should operators fail to continue the repressuring program.

He said inspectors are making daily checks of the program's progress in the subsidence area, and are filing reports with him.

•

Leasing News

Oil and gas leases on some Texas state school lands to be offered Apr. 7 will require high bonuses.

Bonuses of $100 per acre are required on 13 acres in Highland Bayou, Galveston County; 160 acres in Hildebrand Bayou, Jefferson County; and 49 acres in Cash Creek, Matagorda County.

Bids on this acreage will be on royalty basis, with bids awarded to those offering highest percentage of production. One-sixth royalty is required. Rent is set at $10 per acre.

Several other tracts will be offered with $50-per-acre bonus requirement and $5 rental. These include 221 acres in Taylor's Bayou, Jefferson County; 160 acres in Clear Fork of Brazos River, Shackelford County; 70 acres in U.S. portion of Rio Grande, Hidalgo County; and two tracts of 175 acres each near Taylor's Bayou, Jefferson County.

Pan American Petroleum Corp. bought more than half of the acreage offered at a recent sale of explorations rights on 2,887,607 acres of Yukon and Northwest Territories land.

The company bid an approximate total of $1.6-million for the acreage, which was offered by Canada's Department of Northern Affairs & National Resources.

Other successful bidders were Triad Oil Co. and B. P. Exploration (Canada), 63,212 acres; Shell Oil Co. of Canada, 473,000 acres; Hudson Bay Oil & Gas, 31,807 acres; Dome Petroleum, 31,485 acres; California Peace River Co.; 63,854 acres; James Ross, 50,000 acres; and Alberta Calgarada Petroleum, 50,000 acres. Bids totaled $6,661,919.

Leases and reservations on 302,255 acres in proved and unproved parts of Alberta will be offered Apr. 16.

The lease sale includes 25,775 acres in the Gilby, Joffre, Kaybob, Keystone, Pembina, Red Earth, Sundre, Swan Hills, and Virginia Hills areas.

The remaining 276,480 acres will be offered as reservations in provincial parcels 78, 79, and 80, in the north and northwest.

•

Magnolia Petroleum Co. is planning a pilot miscible displacement program in the Atlee A reservoir underlying the La Gloria field unit, Brooks and Jim Wells Counties, Tex.

By injecting LPG and natural gas into the reservoir, Magnolia will seek to determine the feasibility of secondary recovery from the various horizons in this area through miscible displacement.

The company also asked the Texas Railroad Commission for an increase in the MER for this horizon from the present 50 b/d per well to the 1957 level of 121 b/d.

Magnolia explained that its project would be a slug-type injection rather than an enriched-gas injection project. Some 1,000 b/d of propane or butane are to be injected.

•

A waterflood program for the Joy (Strawn) field, Clay County, Tex.—aimed at boosting production by 2-million bbl.—has been requested by Shell Oil Co.

Appearing before the Texas Rail-

Shell Installs Louisiana's First ACT

J. H. Stell, lease foreman in Shell's Good Hope field, St. Charles Parish, La., checks the operation of Shell's new ACT system. The Shell system prints the meter reading on the run ticket, and continuously checks the specific gravity, and the basic sediment and water content of the oil automatically.

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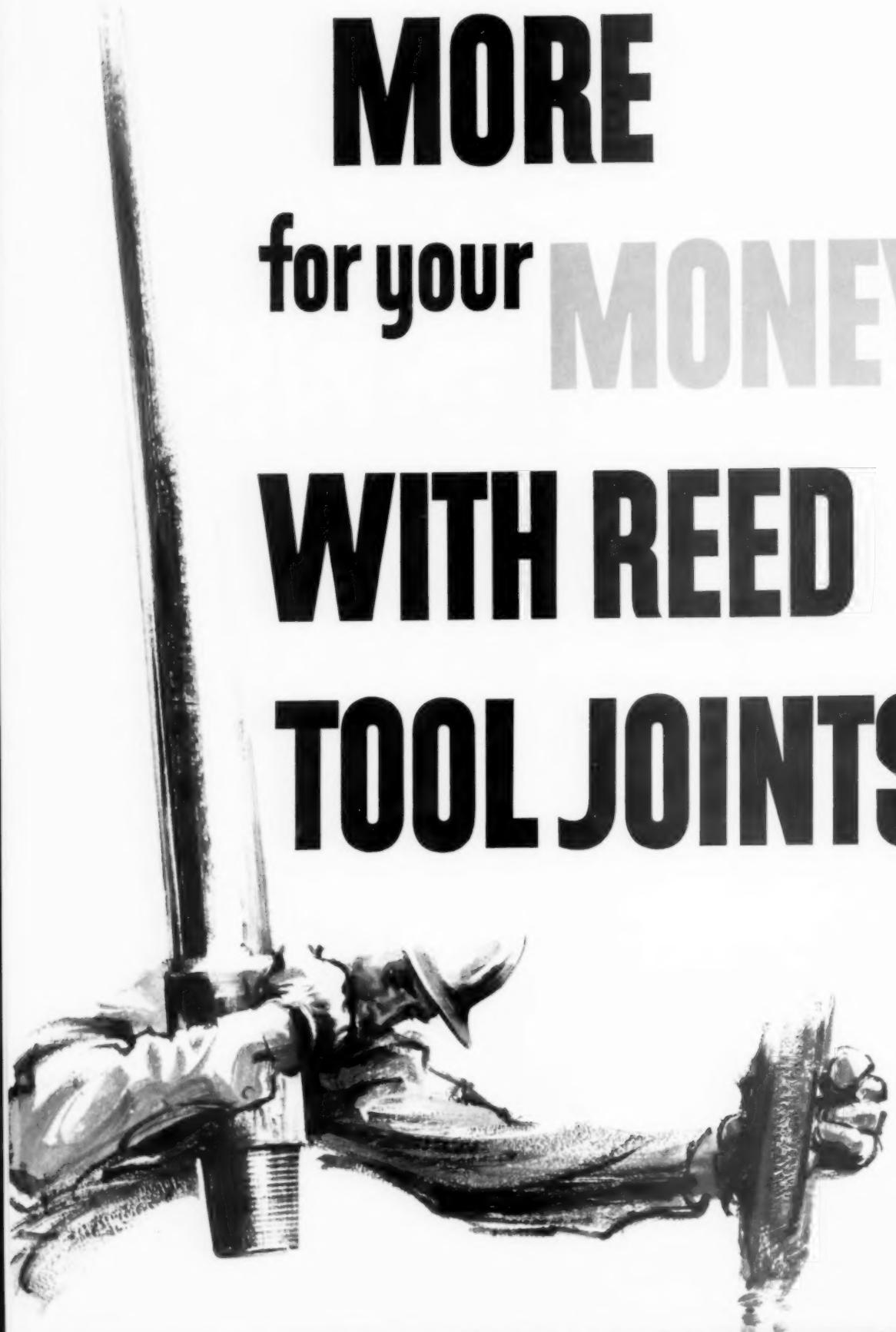

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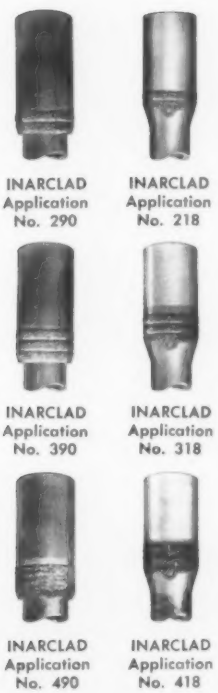
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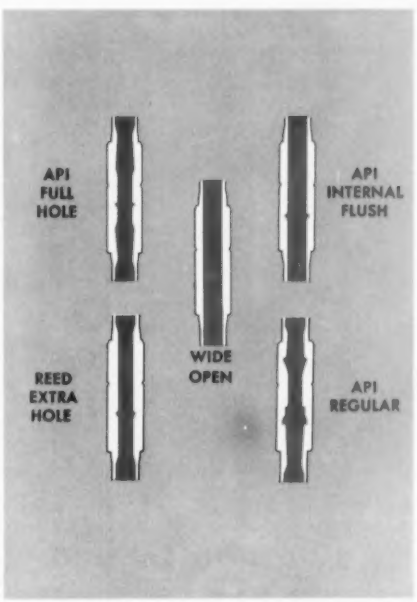

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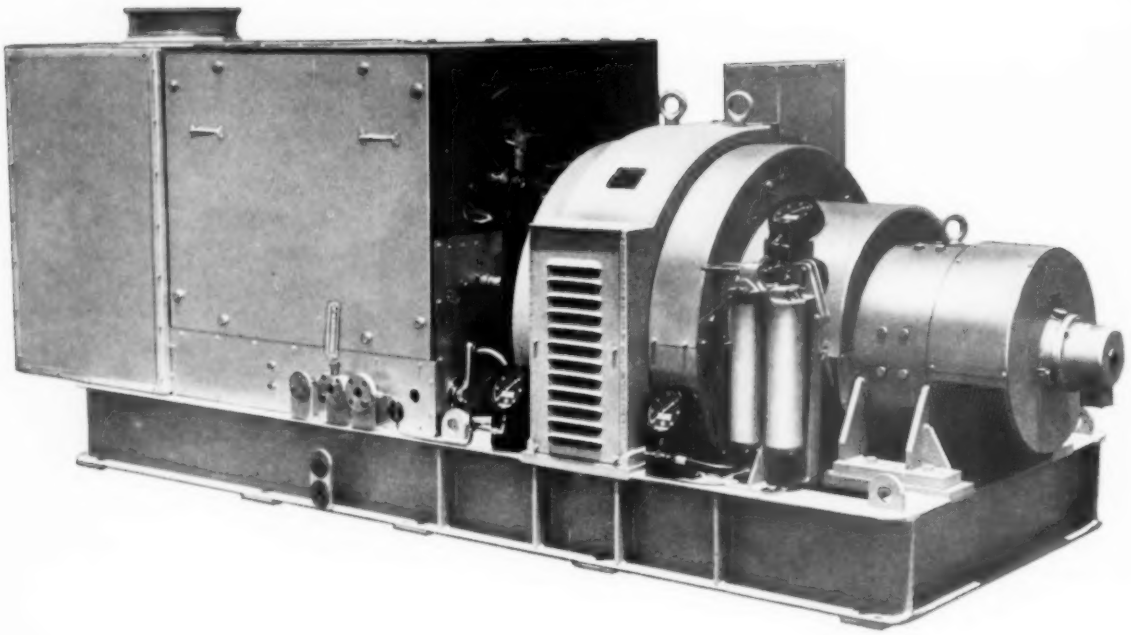

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POWERED BY a 300 hp Jupiter® gas turbine, Solar's 300-kw generator (above) weighs only 6900 lb and is considerably smaller than the average automobile. Solar's 50 hp Mars® gas turbine-powered pump (left) delivers 500 gallons of water per minute—as much as a good-sized fire engine—yet can be carried easily by two men. For more information about these and other Solar gas turbines, write to Dept. F-134, Solar Aircraft Company, San Diego 12, California.

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road Commission last week, Shell said its plans call for flooding the Shell-G. W. Scaling A and B leases, and for expanding a flood program already under way on the Shell-Scaling and E. J. Houston leases, 4,400 ft. and 4,500 ft. sandstones.

•

Two Tennessee Gas Transmission Co. units in Utah have been approved by the U.S. Geological Survey.

The second wildcat on the Poison Springs unit, Garfield and Wayne Counties, is now being drilled. The first test on this block had shows, believed by TGT to be in a well-developed Pennsylvanian reef. The unit is in 11e and 12e, 28s and 29s.

The Sorrel Butte unit already has had one unsuccessful wildcat. This block—19,200 acres—is in Wayne County, 11e and 12e, 28s, 29s, and 30s.

•

A symposium on petroleum geochemistry will be held at Fordham University on June 4, during the World Petroleum Congress, which will be held in New York City that week. The meeting will consist of an informal, open discussion of papers submitted by researchers active in this and related fields.

Deadline for papers to be submitted is Apr. 1. Inquiries should be sent to Prof. Bartholomew Nagy, DEPT. of Chemistry, Fordham University, New York City. Moderator for the discussion will be Dr. G. D. Hobson, of the Imperial College of Science & Technology, University of London.

•

Continental Geophysical Co., Ft. Worth, has purchased all equipment owned by Williams Seismograph, Inc., of Wichita, Kan.

Charles C. Williams, owner of the Wichita concern, will be associated with Continental.

•

Engineering

A newly-developed permanent-type inflatable packer is reportedly being used successfully to obtain positive seal in open hole.

The tool, manufactured by Lynes, Inc., of Houston, is said to seal in irregular wall open hole up to twice the deflated diameter of the packer.

Use of weight or mechanical trips is not required for the setting operation. Instead, when the tool reaches setting depth, fluid is pumped into the steel-reinforced packer element, expanding it against the wellbore. After the tool has been set, a check valve keeps the packer element inflated, allowing tubing through the packer to be opened.

The packer has been used primarily in waterflood operations.

•

A new "inside" blowout preventer and fully automatic control system has been developed by Hydril Co.

The "mechanical watchman," according to a Hydril spokesman, will permit shutting in and control of flowing wells in the event of damage to or breakage of flowlines or surface fittings.

Known as the Hydril Well Guard, the system is said to be capable of operating around the clock in any kind of weather.

•

Drilling Highlights

West Texas—Pan American Petroleum Corp. and Westbrook-Thompson Holding Co. No. 1-A Hendrick, section 40, block B5, psl survey, Emperor field, Winkler County, was completed as a dual gas producer, rich in liquid content.

The well showed an absolute open flow potential of 550-million cf/d of gas through perforations at 11,405-15 ft. in the Ellenburger, plus 54.6-gravity distillate at the rate of 1 bbl. to 56,500 cu. ft. of gas, giving it a maximum fluid output of 9,716 b/d.

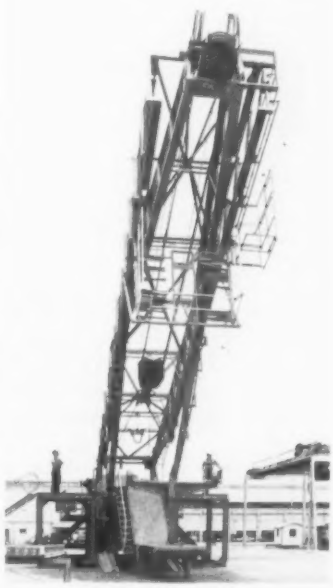
The well also gauged 220-million cf/d of gas through seven sets of perforations in the Devonian between 9,100-235 ft., plus 53.2-gravity distillate at the rate of 1,833 b/d. Despite its high fluid potential, the well's daily distillate output will be limited to allowable gas production.

In Andrews County, Continental Oil Co. No. 1 Kemper, 1½ mi. northeast of Bakke pool, flowed at the rate of 61 bbl. of oil per hour on drillstem test at 9,106-47 ft.

Mississippi—Jett Drilling Co. No. 1 Magee, section 17-1n-4e, Simpson County, tested to flow 217 b/d of 38-gravity oil through perforations at 12,458-82 ft. in the Mooringsport lime. Operator is preparing to test Paluxy sands between 11,238-12,186 ft. in an effort to complete dually. The wildcat is 15 mi. southwest of Marinsville field.

Oklahoma—Fain-Porter Drilling Corp. No. 1 Mathis, section 34-6n-3w, McClain County, flowed 207 bbl. of oil in 17 hours through 20/64-in. choke and perforations in the Hunton at 8,223-42 ft. The discovery is located 1½ mi. northeast of East Payne field.

New Rig Has Unusual Lifting Mechanism



This new portable, trailer-mounted rig was unveiled last week by Continental-Emsco Co. Its most unusual feature is the way it is raised. A "raising arm" lifts the lower section of the 97-ft. mast to an upright position. A wire line then lifts the upper section into place. Four pins automatically engage, and lock the two sections in place.

The rig is designed for drilling to 5,500 ft. It has a rotating capacity of 250,000 lb., and a setback capacity of 132,000 lb. The mast hook load is 250,000 lb.

The company last week also displayed the new, expanded facilities at its Houston plant. The expansion program, which totaled $3-million and almost doubles the company's manufacturing capacity began after company officials decided to phase out the firm's Los Angeles plant and transfer the equipment to Houston.

Chevy power is tough—

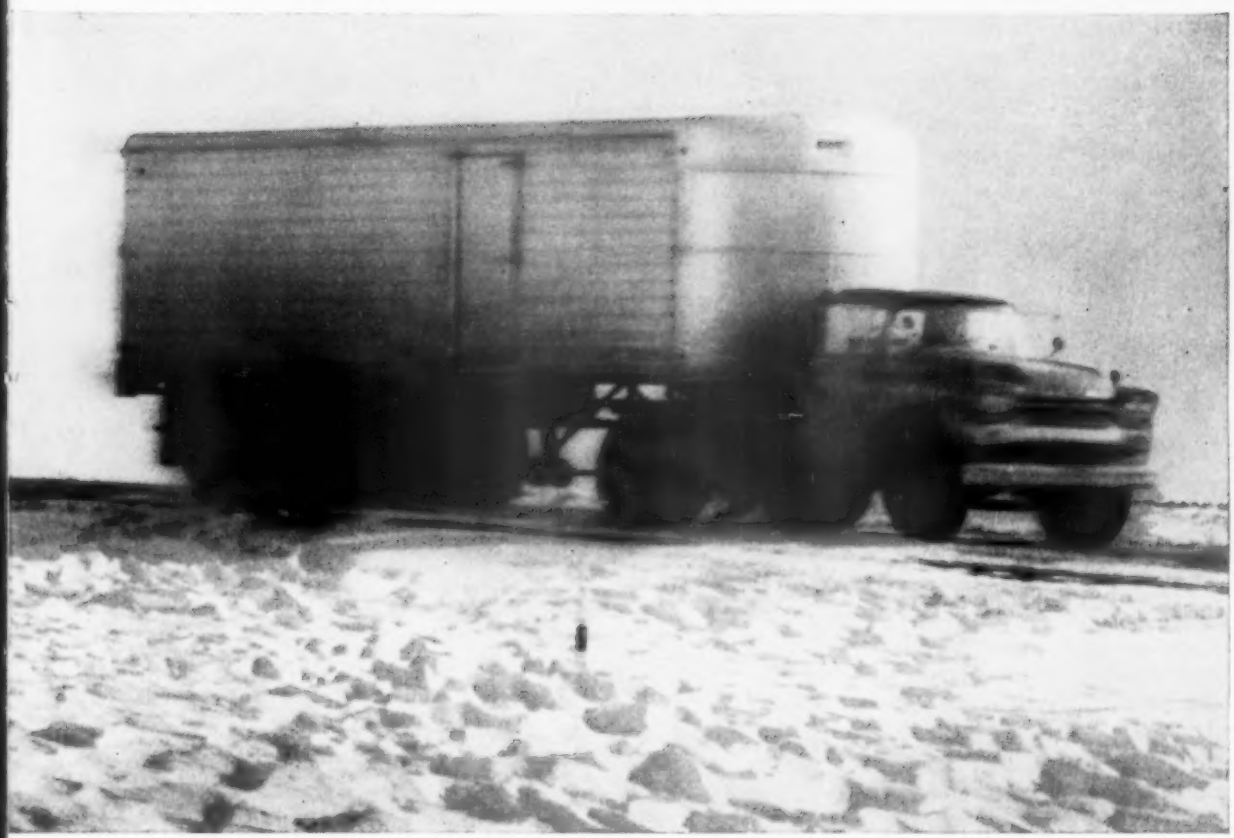
and proves it on high-tonnage north country grind!

This hauler had 104,000 miles on his Chevy heavy-duty V8 before even a valve job was needed! William Brosius of Grand Forks, N.D., works his Chevrolet Series 100 models hard, all year round. Summers, they pull 10-yard boxes for hauling sand and gravel. The rest of the year, in all kinds of north country weather, they pull tandem trailers with full-capacity loads of potatoes or grain. "They keep at it all the time," Bill Brosius says. "One of them even covered 104,000 miles before a wrench ever touched the engine to take off the heads or pan."

That's a *tough* truck job—but there's a big 348-cu.-in. Workmaster V8 under the hood of that 10203 Chevrolet shown above, delivering the kind of durable power that's rating it tops for efficiency on rugged runs. A Spicer 5-speed transmission and an Eaton 18,000-lb. 2-speed rear axle round out a dependable power team.

In less than a year, this heavyweight model (which also features frame reinforcements, cast-spoke wheels and heavy-duty springs) has covered over 120,000 miles! Tough-built big-truck components make Chevrolet's new heavyweights or middleweights the best trucks yet for your long hard hauls!

No job's too tough for a



Chevy's powered to cut costs and keep going on your long, hard hauls!

That's for *sure*, whether you use mighty middleweights or high-capacity heavyweights—whether you prefer V8's or 6's.

Take Chevrolet's 1959 big-truck V8's, for example. As indicated by that tough truck job pictured above, these modern engines are out to whip any work that comes their way. They've got what it takes to do it. The *shortest piston stroke* of any comparable truck V8's: a sure sign of more work on less fuel. Compact design that cuts down on truck weight and helps assure the biggest possible payloads. Scores of up-to-the-minute features that know how to trim overhead: full-flow oil filter, hydraulic valve lifters, hard-faced exhaust valves and hardened valve seats, extreme-duty Moraine 400 bearings, rotor-controlled governor, overspeed warning light, and many more.

And with a *complete* lineup of modern V8 powerplants—including 160-h.p. Trademaster, 160-h.p. HD Taskmaster, 175-h.p. HD Super Taskmaster, 185-h.p. Workmaster Special and 230-h.p. Workmaster—Chevy can match the engine to your work, ideally.

Or if you prefer 6's, Chevy's *still* your best bet. Standard in Series 40 models is the 135-h.p. Thriftmaster 6, better than ever for '59 with a new Economy-Contoured camshaft that improves gas economy by 10%! And in series 60 there's a new edition of the 150-h.p. Jobmaster 6. It offers new durability stemming from new tougher built pistons, Stellite-faced exhaust valves and chrome-plated oil control rings. Both of these famous 6's provide plenty of hard-pulling torque.

Six or V8, you'll go a long way before you see the likes of this '59 Chevy engine lineup. Actually, there's only one *best place* to go for all your trucking needs—and that's to your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Chevrolet truck!

CHEVROLET

SAVE money

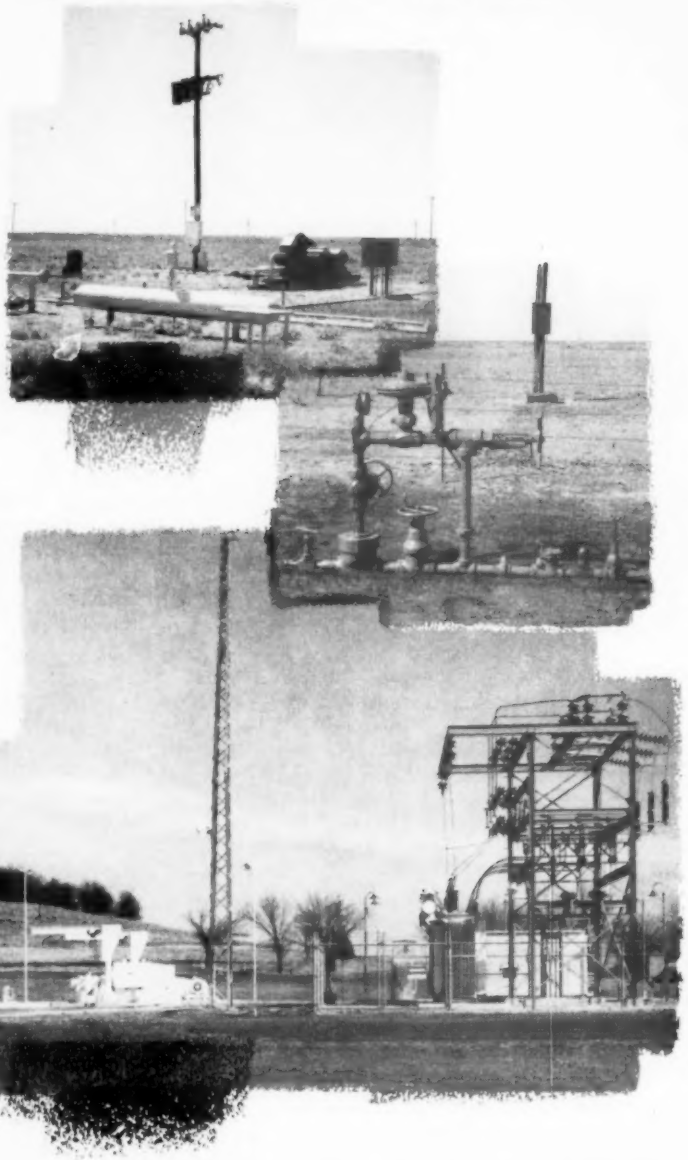
SAVE maintenance

SAVE manpower

SAVE with Remote Control

The remote controlled crude station pictured below is typical of modern application of low-cost Purchased Electric Power. A smaller remote controlled pipeline installation is shown at the top.

However, remote automatic electrical control may take a simpler form. The illustration at the right shows an electrically operated solenoid valve on a flowing well, controlled by an electric time clock. To take advantage of the many outstanding savings offered by Purchased Electric Power call your nearest Utility Electric Service Company or write us.



Remote controlled crude station with electrically controlled valves and sump pump

PEPA

Purchased Electric Power saves money, manpower, maintenance and serves you better automatically

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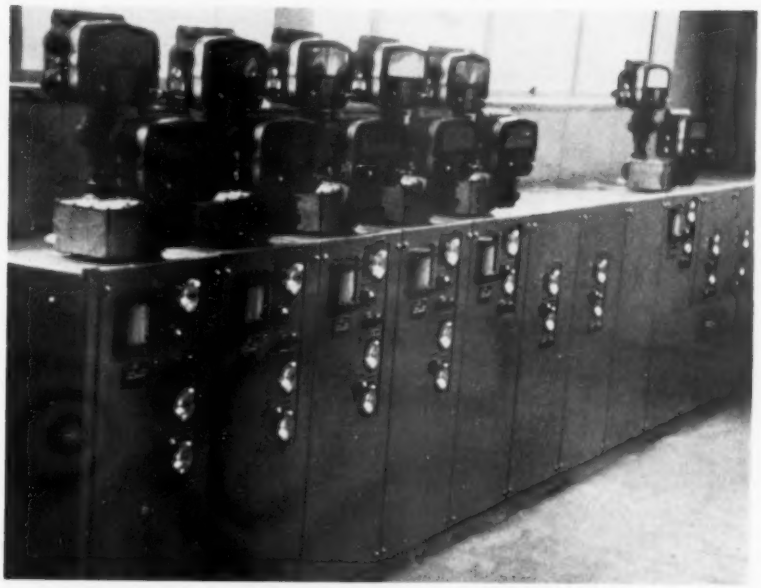

METER CONTROL CONSOLE like this one is automatically summing and adjusting readings from meters at input and offtake stations on the Little Big Inch line.

Now: Integrated Meters

Product pipeline metering is taking a big step forward with the new "meter accounting system," which is being used for the first time on the Little Big Inch system of Texas Eastern Transmission Corp.

Pipeliners have long been concerned about meter accuracy and speed, especially where long distances and large volumes have been involved.

They've had some of their concern soothed recently by development of individual meters—mostly positive-displacement type—with significantly greater capacities than earlier meters. Meter-makers are now marketing products that can handle 15,000 or even 20,000 bbl. per hour (PW—Feb.13 '59,p39).

But on some of today's larger-diameter lines, even a single 20,000-bph. meter can't do the measuring job adequately. So it's common practice to parallel two, three, or more meters to cover the large flows encountered.

The trouble with this operation, however, is that data from all meters must be summed and adjusted. Such computations have generally been done manually—with speed and accuracy serious problems.

These problems are more acute in products systems than in crude systems because of the variety of fluids carried in a products line. Each product must be "accounted for" individually.

Texas Eastern says its new meter accounting system is responsible for a "more efficient operation."

H. M. McDonald, vice-president in charge of operations on the Little Inch system, told PETROLEUM WEEK last week that "use of the consoles has made possible more efficient operation, and has rendered a satisfactory accounting to our shippers of the quantities of products they deliver to, and receive from, the Little Inch system."

The meter console has been in use on the system since its reconversion to products service last year.

The system's main advantages: new speed and accuracy.

The system was built for Texas Eastern by Proportioneers, Inc., a division of B-I-F Industries, of Providence, R. I.

Proportioneers says that the equipment used by Texas Eastern can "eliminate delays and inaccuracies in reporting metered volumes."

On accuracy, the manufacturer says the system offers calibrated accuracies up to ±.02%, with all readouts corrected for meter factor and temperature. The system is also said to eliminate all possibility of human error, because manual computations are unnecessary.

On speed, Proportioneers contends that its automatic system leaves human computers in the dust.

Because of its speed, Proportioneers points out, the system can give a virtually continuous record of meter readings.

The new meter accounting system transmits meter readings by means of electrical impulses.

Proportioneers says the system can be used with any make of positive-displacement meter. Here's how the system operates:

A transmitter on each meter sends its reading by electrical impulse to the console receiver.

Proportioneers says that this transmission principle does not backload the meter, and will operate accurately at all upshaft speeds throughout the meter range.

The receiver actuates totalizers at the console base, which give a gross uncorrected reading, matching the reading on the meter itself.

In order to obtain meter factors for volumetrically correct readings, a special, weather-proof calibration totalizer is installed on each meter. This is a cumulative totalizer and a solenoid-actuated reset register combined. It reads in barrels and hundredths of barrels.

The reset register calibrates against a loop or suitable prover tank system. It also provides "fail-safe" protection in case of power failure.

The meter factor, as determined by the calibration check, is manually dialed on a micrometer.

Temperature correction is carried out by another micrometer.

Two ticket-printing registers are mounted atop the summation console. An electrical selection mechanism can automatically swing the printing function from one printer to another.

The system's electronic data transmission makes possible remote meter-reading.

On the Little Big Inch line, meters at all input and offtake stations report via the meter accounting system.

Because distance matters little in transmission of electronic signals, the meter console can be located quite some distance from the meters it serves. The console can therefore be used in a pipeline terminal, in a booster station, or at a central control center for the entire pipeline system.

The meter accounting system can be altered to suit the demands of the particular products system.

One of the optional pieces of equipment is a remote data readout counter.

Other rearrangements and modifications, Proportioneers says, can be made to suit specific job requirements.

Edmund S. Budd, *Manager of Parts Division, The Cooper-Bessemer Corporation, points out that...*

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What's New / IN TRANSPORTATION

"Substantial savings" have reportedly been realized in building a small-diameter products system in New York by saddling branch lines directly onto headers, thereby eliminating the need for "T" connections.

The system is made up of 13 mi. of parallel 6-in. and 8-in. lines, which bring jet fuel and avgas from terminals to the Plattsburgh Air Base.

C. Emmett Wilson, contractor on the project, says that elimination of the "T" connections on the headers has resulted in savings in both materials and welding costs.

•

The latest wrinkle on jumboizing: make a couple of barges out of the discarded tanker midsection.

That's what Atlantic Refining Co. has just done with a midsection removed from one of its tankers in a jumboizing operation.

Atlantic says that, "although the cost of this conversion job was about the same as the construction of two new barges, the heavier steel in the midbody made the project worthwhile."

Besides, what else can you do with a junked tanker midsection?

•

Interstate Oil Pipe Line Co. is increasing the pumping capacity of its Liberty (Miss.) station by converting it from diesel-engine to electric-motor drive.

Station horsepower will be increased from 2,700 to 3,600 when the project is completed in June. As a result, the Liberty station will be able to pump 112,000 b/d.

Reason for the increased horsepower: increasing crude production in the Mississippi areas served by the station.

•

Underground storage of natural gas is getting a start in Japan.

Underground gas storage in the U. S. has been increased greatly in recent years. In fact, total reservoir capacity here is now about 2.9-trillion cu. ft. (PW—Dec.12'58,p45).

The reservoirs are used to store gas during low-demand periods for use by large markets during peak-demand periods.

The problem of gas storage is much the same in Japan, and Tokyo Gas Co., Ltd., intends to try the same solution. The company will begin work soon on Japan's first underground storage project. The reservoir will be just outside Tokyo.

Ball Associates, Denver consulting firm, has contracted with Tokyo Gas for supervision of the drilling operations.

•

Trans Mountain Oil Pipe Line deliveries are below last year and are likely to stay that way.

Trans Mountain says it moved an average of 93,553 b/d in February, compared with 95,166 b/d in February, 1958.

The company also says it expects to deliver about 85,000 b/d this month.

Last March, Trans Mountain delivered an average of 99,069 b/d.

•

Another port, this one at Augusta, Sicily, has been redeveloped to handle tankers up to 100,000 tons.

Only a few ports in the world now provide the depth and docking facilities to handle such large tankers (PW—Jan.30'59,p40). A special dock just completed at Augusta to berth 100,000-tonners will be 3,740 ft. long.

•

Engineering

Rockwell Mfg. Co. has developed a 15,000 bbl.-per-hour positive "screw displacement" meter, which, the company claims, is "superior in accuracy, reliability, and flexibility to any positive displacement meter or any high flow-capacity meter now on the market."

The New Rockwell "Turbo-Meter" is based on the principle that there is a direct relationship between the rate of liquid flow through the meter and the speed at which a rotor metering element is rotated by the force of the flowing liquid.

Rockwell says the meter has a working pressure to 150 psi. and accuracy to 0.05%.

The meter will be officially shown for the first time at the International Petroleum Exposition.

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Profits Should Ease Borrowing in '59

Although 1959 won't be an "easy money" year, it's likely to see enough credit available to satisfy all the demands that oil companies—or other industries—place upon the banking system. This conclusion may seem surprising after the way interest rates have risen in recent months. But it rests on three solid facts about the money market.

(1) There is not going to be much borrowing for plant and equipment. The McGraw-Hill survey of business capital spending plans for 1959 shows only a slight increase over the 1958 level. The total for 1959 comes to more than $33-billion. But that will be far below the 1957 level of $38-billion. The need to replenish inventories (depleted during the record 1958 liquidation) will be the main business requirement for capital during 1959.

(2) Profits are rising for business in general—as well as for oil. Sales forecasts for the coming year are uniformly optimistic. And, reflecting the cost cutting induced by the recession, profit margins are improving. This makes total profit prospects all the brighter. If these profits materialize, business will be relatively free from concern over the availability of credit, as it will be able to finance most needs with its own funds.

(3) The federal deficit is diminishing. The Treasury has been relying heavily upon commercial banks and private lenders to supply its cash needs in recent months. But in the new fiscal year, it appears certain that the deficit will be smaller than in 1958.

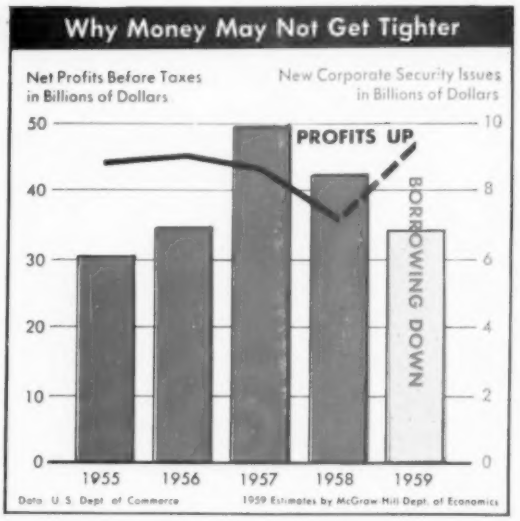
Prospects are, then, that, although the U.S. Treasury will continue to be an important borrower throughout 1959, it will not be the overwhelming force it was last year.

The role played by borrowing by state and local governments certainly can't be ignored. Capital expenditures by these agencies—mostly financed by bond issues—are now twice as high as they were ten years ago. And even during the recession year, 1958, construction contract awards by state and local governments increased substantially.

It's easy to see that "little" government is not too far behind "big" government as a factor in the money market. But it's doubtful that municipal borrowing will increase as much this year as federal borrowing declines.

* * * *

One thing that could put new pressure on the market is the behavior of the almighty consumer. And indications are that consumers in general will be in a buying mood this year. They are confident that the recession has been beaten, and that their personal incomes are secure. Many managed to clear themselves of debt during 1958 and are now willing to take the "plunge" and buy new durable goods that they may have postponed buying during the recession.



A big factor in determining how actively consumers will be seeking credit during 1959 is their reaction to new automobile models. If demand for 1959 models picks up, and sales exceed earlier performance, total consumer credit may increase by $3-billion over 1958.

Home-building is another important item for which consumers need credit. Indications are that the residential construction industry will have a busy year—which will, of course, mean a large demand for mortgage money.

And, of course, there is always the question of what the monetary authorities will do. They are strongly behind President Eisenhower's determined effort to hold the line on inflation. The recent increase in the discount rate on loans to commercial banks indicates that they are ready to take action in the face of new inflationary pressures.

* * * *

But barring a new surge in home-building or in consumer credit, bank loans will not be rising rapidly, and there will be no need for a drastic shift to tighter money.

There seems to be no real prospect, then, that the banks will have to ration credit to industrial companies. Most oil companies—both large and small—should find credit available when they need it, and without any great rise in the interest rate.

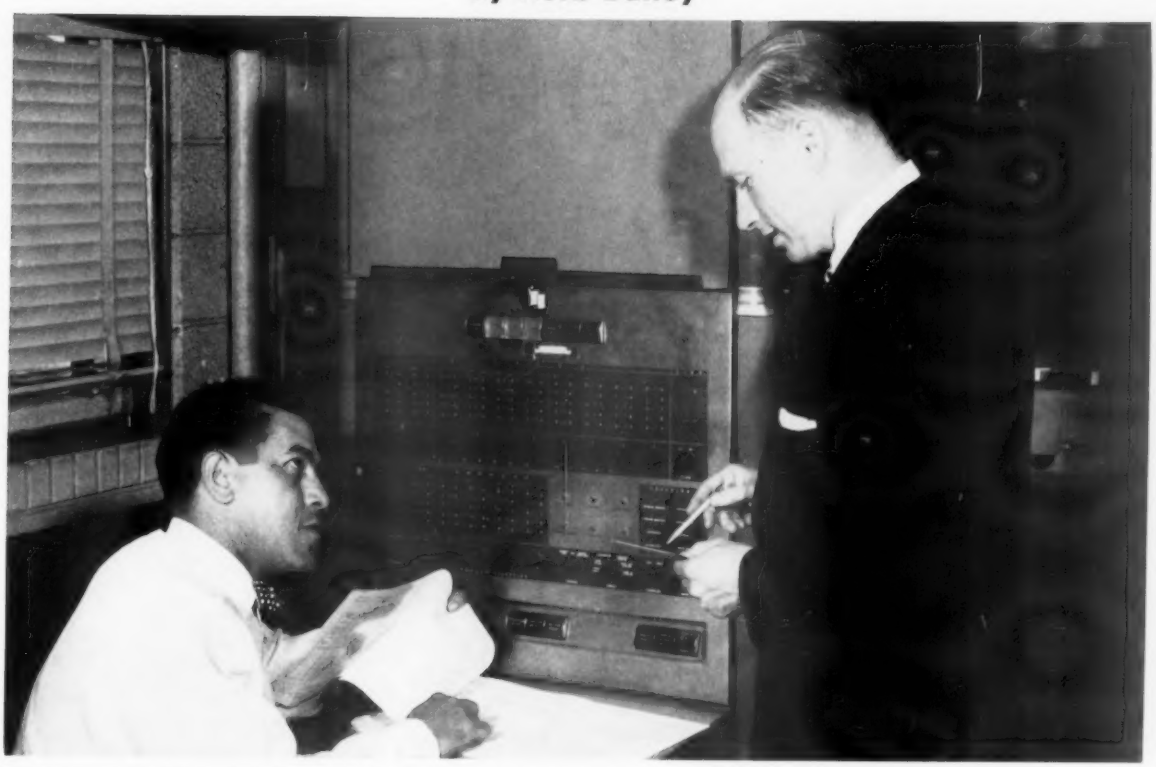
DU PONT *Petroleum Chemicals* NEWS

Number 93 in a Series of Bulletins for the Petroleum Industry

MARCH-APRIL 1959

Du Pont Helps Refiners Set Up Linear Programming

by Herb Bailey



Herbert O. Bailey, one of Du Pont's refinery technologists, and Joseph Testa discuss a linear programming problem as it is being fed into the computer. In just a few minutes the solution will emerge. Done by hand, the problem would have required weeks of time and reams of paper to solve.

Du Pont Develops AFA-1 for Aviation Gasoline

A new additive (AFA-1) is now being offered by Du Pont as a corrosion inhibitor for aviation gasoline. Since low dosages of AFA-1 are effective, it offers refiners opportunities for substantial savings in corrosion inhibitor costs. Another advantage of the low dosage is that the water tolerance test on aviation gasoline is more easily passed.

For details on this product and its use, call your Du Pont representative at the nearest Petroleum Chemicals Sales Office.

In today's highly competitive petroleum industry, maximum economy in all phases of operation has practically become a management "must."

An important tool in effecting economies is linear programming.

Linear programming, through the use of electronic computers, makes it easily possible to determine the economic effect of all known processing and blending variables in the production of gasoline. In this way human errors arising from prejudgment are minimized.

In order to help the refining industry take fuller advantage of the economy and efficiency offered by the use of linear programming, the Du Pont Petroleum Chemicals Division now offers a new technical service.

This service consists of helping refiners to organize the vital variables of processing and blending in such a way that modern calculation methods can

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DU PONT *Petroleum Chemicals* NEWS

CONTINUED *Linear programming*

be used to get an integrated analysis of all gasoline manufacturing operations.

The Du Pont refinery technologists have completed numerous linear programmed studies of gasoline blending economics for customers. Operating variables and incremental manufacturing costs are incorporated in the evaluations.

These studies include such items as: the volume and value of the gasoline components in each blend; optimum reformer severity; the volume of components which should be purchased or sold; the product quality shortage or giveaway on all inspections related to specifications; the loss sustained by diverting components to other grades of gasoline or products through choice or necessity; the range over which the economic variables in a study may shift without changing the recommended blends; and, of course, the economic usage of TEL as an octane control additive.

While such studies obviously cannot always result in major savings, in one instance it was shown that a loss of over $1.00 per barrel was being suffered by diverting one component to a less profitable alternate use. In a second instance, the price being paid for a purchased component was much more than its worth to the user. Such results as these could be determined in an analysis of your own operations.

The men responsible for our linear programming service

JACK S. BELLAH joined the Petroleum Chemicals Division as Refinery Technologist in 1953. He is a graduate chemical engineer from the University of Tennessee. He spent six years at the Socony-Vacuum Oil Company working on petroleum test programs, economic studies, process engineering, and product development. He also worked for Mathieson Alkali Works and at Stanolind Oil and Gas Company in Tulsa, and the Refinery Engineering Company before coming to Du Pont.

HERBERT O. BAILEY holds a chemical engineering degree from Rensselaer Polytechnic Institute. Mr. Bailey spent 12 years in the Technical Service Division of Esso Standard Oil Company doing refinery test work, gasoline blending studies, and crude oil and finished product evaluations. He joined Du Pont in 1953, starting in sales. Last year he joined the Planning Section in Wilmington as a Refinery Technologist.

New Series–Additives Handling Bulletins

Just a year ago Du Pont began a service designed to make the use of petroleum additives as easy and economical as possible for Du Pont customers.

It consists of a series of bulletins on special subjects of interest to those who buy additives.

The first bulletin deals with the use of duplex pumps in place of the simplex type for keeping additives free-flowing in cold weather.

Another bulletin covers in detail the knowledge needed for the easiest and most efficient handling of Du Pont Rust Preventive No. 2.

These bulletins are written by the men of the "Operations Group." All of them are experienced in the handling of tetraethyl lead and other petroleum additives.

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Du Pont Tetraethyl Lead and other Petroleum Additives

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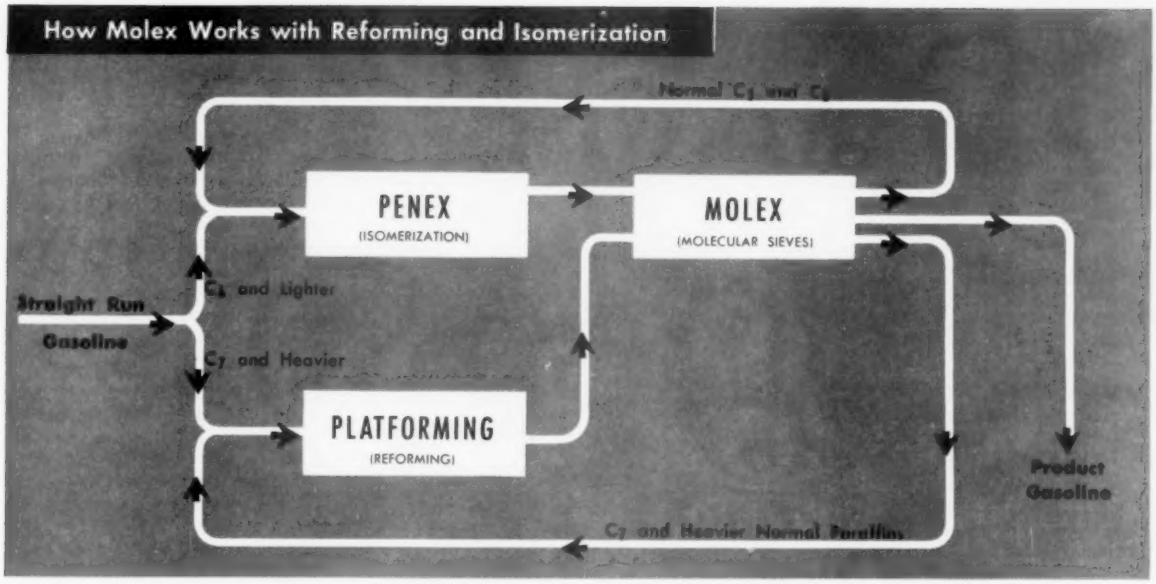

By removing normal straight-chain molecules . . .

UOP's 'Molex' Process Boosts Octanes

Molex, a new process to remove low-octane normal paraffins from gasoline streams by use of "molecular sieves," was announced this Tuesday by Universal Oil Products Co., Des Plaines, Ill.

The process, UOP says, is the first of its type to be made available for licensing to the refining industry as a tool for removing normal paraffins from a mixture also containing isoparaffins and cyclic hydrocarbons.

Specifically, UOP feels that Molex should have economic advantages when used in conjunction with UOP's Penex, or other isomerization processes, to separate isomerized pentanes and hexanes from normal pentanes and hexanes; when used to remove heavy, low-octane, normal paraffins from catalytic reformate; or when used to give "super-octanes" in combination with isomerization and catalytic reforming.

These are the views presented by D. B. Broughton and D. B. Carson to refiners attending the Western Petroleum Refiners Assn. meeting in San Antonio, Tex., this week.

Normal paraffins occur throughout the entire gasoline boiling range, and cannot all be removed economically by conventional distillation alone.

While many of these normal paraffins are derived from light, straight-run and natural gasoline fractions, others can be found spread all through the boiling range of the most highly reformed gasolines, Broughton and Carson said.

The basis of the problem is that, although the total amount of normal paraffins might be enough to penalize the gasoline's octane, the concentration of each particular normal paraffin is low.

Molex, however, uses molecular sieves to remove selectively all normal paraffins from a hydrocarbon stream containing a mixture of normal and isoparaffins along with cyclic hydrocarbons.

These sieves are made of a porous mineral substance, with pore sizes tailored so that normal (or straight-chain) paraffins will enter the pores and be absorbed. However, iso- (or branched-chain) paraffins, cyclic com-

How Molex and Penex Pay for Themselves

(Basis: Reforming 10,000 b/d of typical Mid-Continent straight-run gasoline)

	Catalytic reforming only	Catalytic reforming plus Penex isomerization and Molex
Product Gasoline (including light straightrun)		
Research octane with 3 ml. of TEL	96.9	102.1
B/d	8,776	8,580
Value, ¢ per gal	12.10	15.56
Value, $ per day	44,600	56,071
Additions because of Penex and Molex		
Product Value, $ per day		11,471
Operating Cost, $ per day		1,710
Gross Profit, $ per day		9,761
Investment required		$2,411,000
Payout on Additional Investment (before taxes and royalty), years		**0.68**

pounds, and aromatics will not enter the pores, and are rejected. The result is that liquid, normal paraffins (regardless of boiling point) are stripped from the hydrocarbon stream.

The basic Molex unit consists of a fixed bed of molecular sieves, and operates continuously.

Process feed and product streams are not interrupted or cyclic, according to UOP, in spite of the fixed-bed nature of the equipment.

Temperatures and pressures are described as moderate, and ordinary materials of construction are said to be satisfactory.

UOP pilot-plant tests of the Molex process show it able to make a sharp separation, giving product purities of over 99%.

A test mixture containing 39.1% normal hexane, 51.8% isoparaffins, and 9.1% naphthenes was processed by a Molex unit. The results:

- The normal paraffin product stream contained 99.2% normal hexane, 0.7% isoparaffins, and 0.1% naphthenes.
- The "denormaled" product stream continued 84.4% isoparaffins 14.9% naphthenes, and only 0.7% normal hexane. The leaded research octane number of this latter stream was 97.4, compared to only 85.3 for the original mixture.

Molex, as a replacement for conventional fractionation, in combination with Penex isomerization has a definite economic advantage, UOP says.

The example shown by UOP is for Penex isomerization of a hydrocarbon stream containing 2,500 b/d of mixed pentanes and hexanes, and having a leaded research number of 87.4. In both cases (Molex and fractionation), the final separated product had a 100.3 leaded research octane.

In the UOP example, the substitution of Molex for fractionation saved $175,000 in capital investment; saved $352 a day in operating expenses; and produced an extra $184 worth a day of salable product.

Another use for Molex is in the removal of heavy, normal paraffins from catalytic reformate to increase product octane.

For this case, UOP uses an example with a Molex unit removing 430 b/d of normal paraffins from a 5,000 b/d stream of 96.0-octane (leaded research) reformate. The remaining 4,550 b/d of Molex-treated reformate had a leaded research octane number of 99.1.

The investment for the Molex unit is listed as $800,000.

Combining Molex with Penex and Platforming in a single process scheme will give the refiner a potential increase of from 3 to 4 or more leaded research octane numbers in his gasoline, according to the UOP spokesmen.

Using the flow scheme shown on the previous page, UOP assumes 10,000 b/d of typical C_5 and heavier Mid-Continent straight-run gasoline feed to the Platformer.

It is further assumed that the Platformer in use is capable of producing a reformate with a clear research octane number of 93 (leaded research octane number of 96.9).

By using both Penex and Molex with the Platformer, the additional investment is $2,411,000. But the product reformate has a leaded research octane number of 102.1, which increases gross profit an estimated $9,761 a day, to give a payout of 0.68 years for the additional investment (before taxes and royalties).

For the refiner not needing maximum octanes at the moment, the

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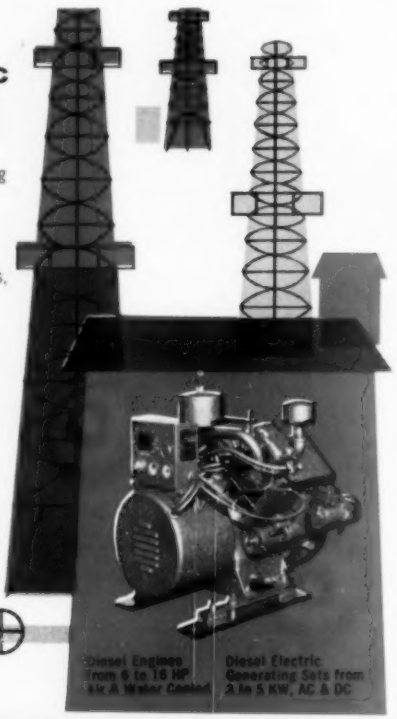
DIESEL POWER

American MARC proudly offers two outstanding products to the Petroleum industry . . . ultra lightweight diesel engines and dependable diesel driven generating sets.

Rugged AMARC air and water cooled diesel engines supply reliable power for compressors, pumps and winches. Available in 6 to 16 HP models. These fully guaranteed field proven units cut your fuel and maintenance costs to the very minimum.

To meet your electric power requirements, AMARC manufactures a complete line of 3 to 5 KW generators available in AC and DC models. These generators, powered with AMARC diesels, keep the current coming . . . and they are built to last.

Write or phone today for complete information on how AMARC products can fit into your operation. Your inquiry will receive immediate attention — Distributor inquiries are invited.



AMERICAN MARC INC.
Dept. PW8 • 1601 W. Florence Avenue, Inglewood, Calif.

for QUALITY . . . QUANTITY . . . SERVICE
Whatever the GRADE and the VOLUME of
NATURAL GASOLINE
Just rely on WARREN'S versatile facilities to give you dependable deliveries . . . WHERE and WHEN and the WAY you want them.

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PETROLEUM CORPORATION
TULSA, OKLAHOMA • Cable Addresses: STAVOLENE, WARREN
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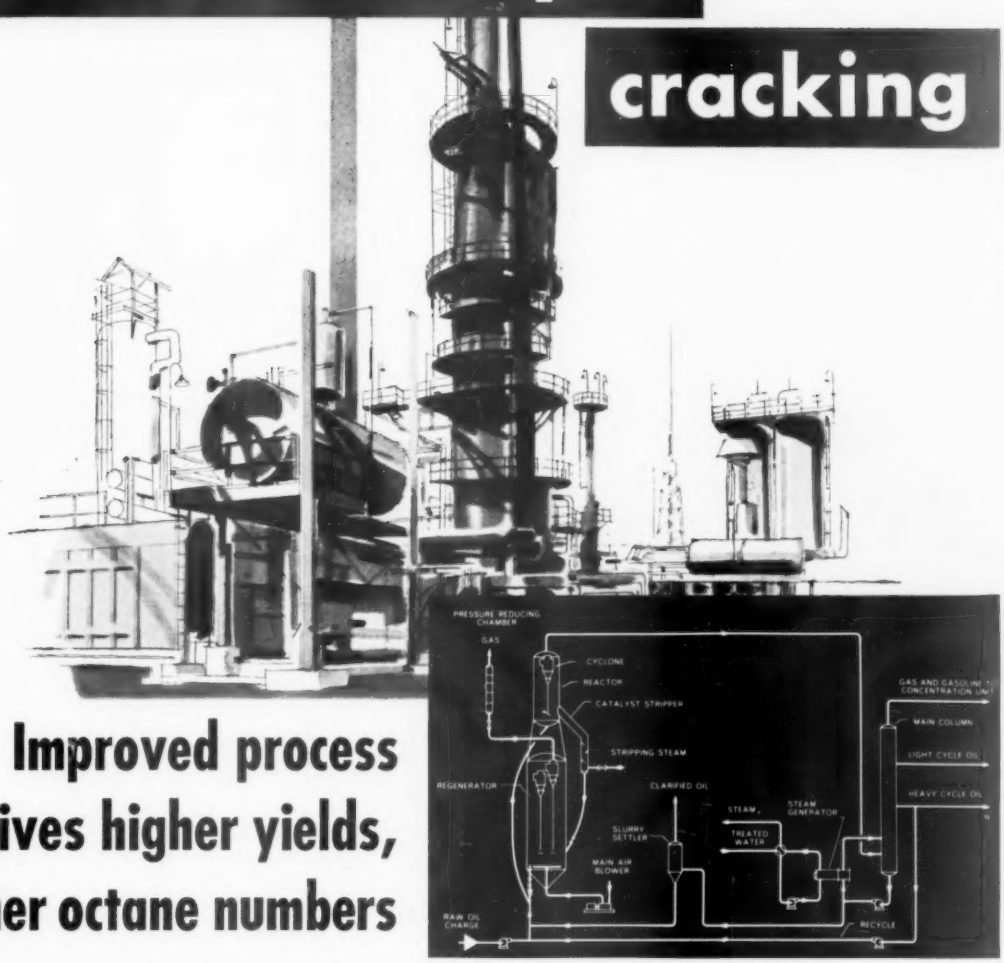
UOP fluid catalytic cracking



Improved process gives higher yields, higher octane numbers

An improved version of the basic and fluid catalytic cracking processes, UOP Fluid Catalytic Cracking converts low-value petroleum fractions to more valuable products. It produces gasoline, distillate fuels and gas for polymerization, alkylation, etc. under a better controlled, consequently more economical operation.

A less complicated, more easily operated, and efficient process, UOP Fluid Catalytic Cracking offers many advantages. The process requires lower original, operating and maintenance costs. UOP Fluid Catalytic Cracking gives longer on-stream time with minimum down-time. Catalyst inventory and consumption rates are low. UOP Fluid Catalytic Cracking can process either light or heavy oils including unvaporized feed stock. Positive contact between catalyst and charge stock assures efficient reaction and operation. Reactor space velocity can be changed, and reactor temperature controlled over a wide range to provide maximum flexibility in adjusting for various feed stocks or product changes.

Widely applied to refinery operations, UOP Fluid Catalytic Cracking offers a convincing record of proved performance.

UNIVERSAL OIL PRODUCTS COMPANY

30 Algonquin Road, Des Plaines, Illinois, U.S.A.

More Than Forty Years Of Leadership In Petroleum Refining Technology

Molex-Penex-Platformer processing scheme can be used to reduce the sensitivity of the gasoline made.

Again assuming a full-range Mid-Continent naphtha feedstock to the Platformer, the addition of Molex and Penex reduces the aromatics in the gasoline. By this reduction in aromatics content, the UOP men said, the sensitivity of the gasoline is reduced by about one full number.

However, Molex does not compete economically with conventional fractionation in all applications.

For separating a complex hydrocarbon mixture (with normal paraffins throughout the boiling range), or for separating close-boiling mixtures (such as iso- and normal pentanes and hexanes from isomerization units), Broughton and Carson say that Molex has "pronounced technical and economic advantages."

A possible future benefit from Molex is the production of substantial quantities of normal paraffins.

Normal heptanes and heavier, from Molex treatment of catalytic reformates, would be an entirely new product from the industry, for which special uses may develop.

Also, these normal paraffins could be raw materials for synthesis of straight-chain organic compounds, such as aldehydes and alcohols. They would be good stock to make ethylene.

The UOP announcement on Molex follows closely the announcement by The Texas Co. that it has developed a refinery process using molecular sieves (PW—Sep.12'58,p33).

Natural Rubber Has Rival

Polyisoprene rubber, man-made duplicate of tree-grown rubber, is going into commercial production and use for the first time, according to a joint announcement by Shell Chemical Corp. and U. S. Rubber Co.

U. S. Rubber has already begun production of truck tires made of the polyisoprene rubber, which is being produced by Shell Chemical at its Dominguez (Calif.) plant.

Shell Chemical will manufacture and sell the new material under the trade name of Shell Isoprene Rubber.

Currently, the rubber is being produced by part-time utilization of commercial equipment located at various Shell Chemical and Shell Oil Co. installations in the Los Angeles area. Reportedly, it was the presence of idle equipment because of the 1958 recession that made Shell Chemical decide to spend about $3-million to enter commercial production of polyisoprene.

For the present, output of the rubber will be held at about five tons a day, to supply U. S. Rubber's current needs, and for evaluations by other customers. This production does not interfere with other products made regularly in these facilities.

As installation of various additions to the plant are made this year, the effective capacity is expected to increase from 15,000 to 20,000 tons annually on a steady basis.

Shell Chemical claims to have developed a new chain of processes, which enables the polyisoprene rubber to compete economically with natural rubber from plantations.

Although several companies have announced the synthesis of polyisoprene in recent years, it has not been produced commercially because of doubt that it could compete commercially with natural rubber.

The current price of Shell Isoprene is 30¢ a lb., f.o.b. Torrance, Calif.—approximately equivalent to the price of the better grades of the natural product, according to the company.

The polyisoprene rubber made by Shell Chemical is said to duplicate the qualities of the best-grade natural rubber—and to be more uniform than average natural rubber.

Since it is made by a chemically-controlled process, the polyisoprene is said to be much more uniform in quality, and of a higher purity, than the average mixture of plantation rubber from different trees.

U. S. Rubber reports that the new polymer has been tested thoroughly in the laboratory and on the road, where performance of polyisoprene truck tires has equalled or exceeded that of natural rubber tires. Large truck tires are still heavy users of natural rubber, because of heavy loads and heat build-up.

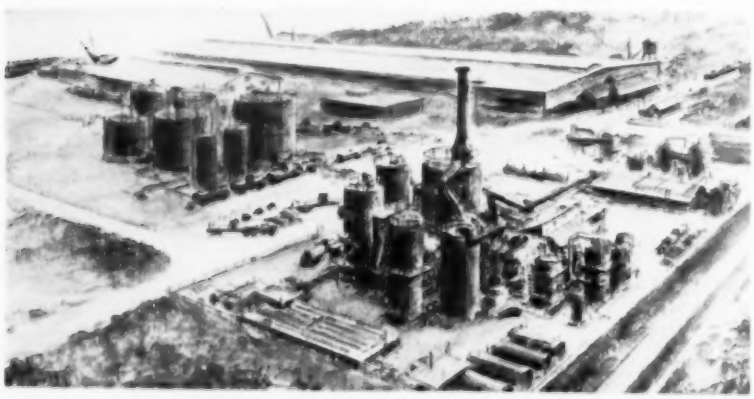
Initial tire production by U. S. Rubber is in the popular 7.50x20 size. As the supply of the new synthetic increases, the company will expand production at its Los Angeles plant to make other sizes of truck tires, plus off-the-road tires, aircraft tires, white-sidewall passenger-car tires.

U. S. Rubber has already found that use of polyisoprene rubber results in production economies.

The company says it has developed new compounding techniques, which make the polyisoprene rubber easier to process than plantation rubber. Also, natural rubber, which is shipped mostly in hard bales, must be run through a plasticator before it can be processed, whereas the synthetic type can be made in any plasticity required.

Many markets that were previously the exclusive property of natural rubber await polyisoprene.

Shell Chemical's new rubber could get a foothold in the manufacture of tires for earth-movers, of footwear, of surgical gloves, of skim-coating for conveyor-belt plies, and of other mechanical rubber products.

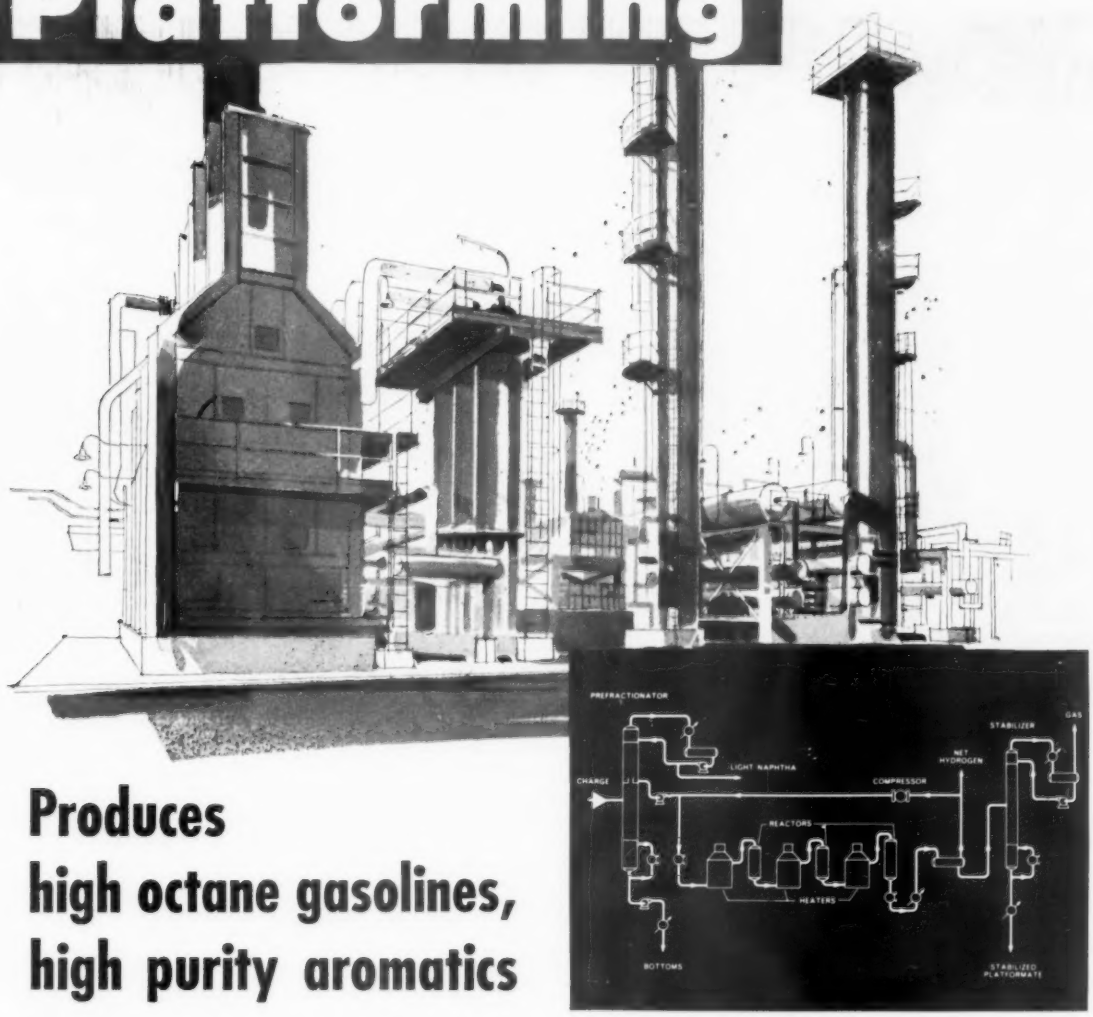


New Plant to Make Acid from Refinery Sludge

Dixon Chemical Industries, Inc., has started construction on a 300,000-ton-a-year sulfuric-acid plant at Paulsboro, N. J. The plant will burn refinery sludge to make the acid. Cost will be $5-million; operation is scheduled during September. Chemical Construction Co. is building the plant, with over-all supervision of the project by Singmaster & Breyer.

The plant is on a 70-acre site which, within 5 years, is to be developed into an integrated chemical producing works.

Platforming®



Produces high octane gasolines, high purity aromatics

No longer need low octane gasolines be a serious problem in refinery economics, thanks to the remarkably versatile refinery tool—UOP Platforming.

Inexpensive to install, easy to operate, reliable and safe, Platforming serves an important dual purpose: Using a platinum-containing catalyst which can operate for long periods without serious deactivation,—hence, expensive regeneration equipment is unnecessary—this practical process provides truly continuous production of superior quality motor fuel from straight run naphthas.

Equally important, it enables the refiner to produce in commercial quantities excellent base stocks for aviation gasoline and Platformate for aromatic extraction such as benzene, toluene and xylenes, now in such growing demand for detergents, nylon, plastics, high explosives and many other products.

As shown in the accompanying flow diagram, the Platformer is a compact unit consisting of a reactor section, stabilizer section, and (optional) feed preparation section. It can handle the full boiling range gasolines without prefractionation, or naphtha cuts separated from them, and efficiently processes any naphtha from crude distillation, natural gasoline plants or cracking units.

Platforming is but one of many UOP refining and petrochemical processes for improving refinery efficiency and producing more salable products. Available to refiners everywhere, these processes are illustrated and described in an informative new booklet. Write for your copy today. Address:

UNIVERSAL OIL PRODUCTS COMPANY

30 Algonquin Road, Des Plaines, Illinois, U. S. A.

More Than Forty Years Of Leadership In Petroleum Refining Technology

See why ALCOA ALUMINUM makes a good design habit

Requirement: Low-cost, corrosion-resistant heat exchanger material
Key to Good Design: Specify Alcoa Aluminum Tube and Sheet

If corrosion resistance, long life, product purity and economy are considerations in your heat exchanger application, specify aluminum! ALCOA® Aluminum has been solving such problems for over 40 years.

In the petroleum industry, ALCOA Aluminum Tubes serve in main column overhead condensers where their freedom from fouling and excellent heat transfer properties have made them a natural selection. Heat exchangers made of ALCOA Aluminum Tube and Plate are used in the production of ammonia, nitric acid, vegetable oils, naval stores, naphthalene, hydrogen peroxide, oxygen and urea. These and other processes call for heat exchangers with combinations of high strength, excellent sub-zero physical qualities, high thermal conductivity, or nontoxic and noncatalytic properties. ALCOA Aluminum alloys meet all these requirements.

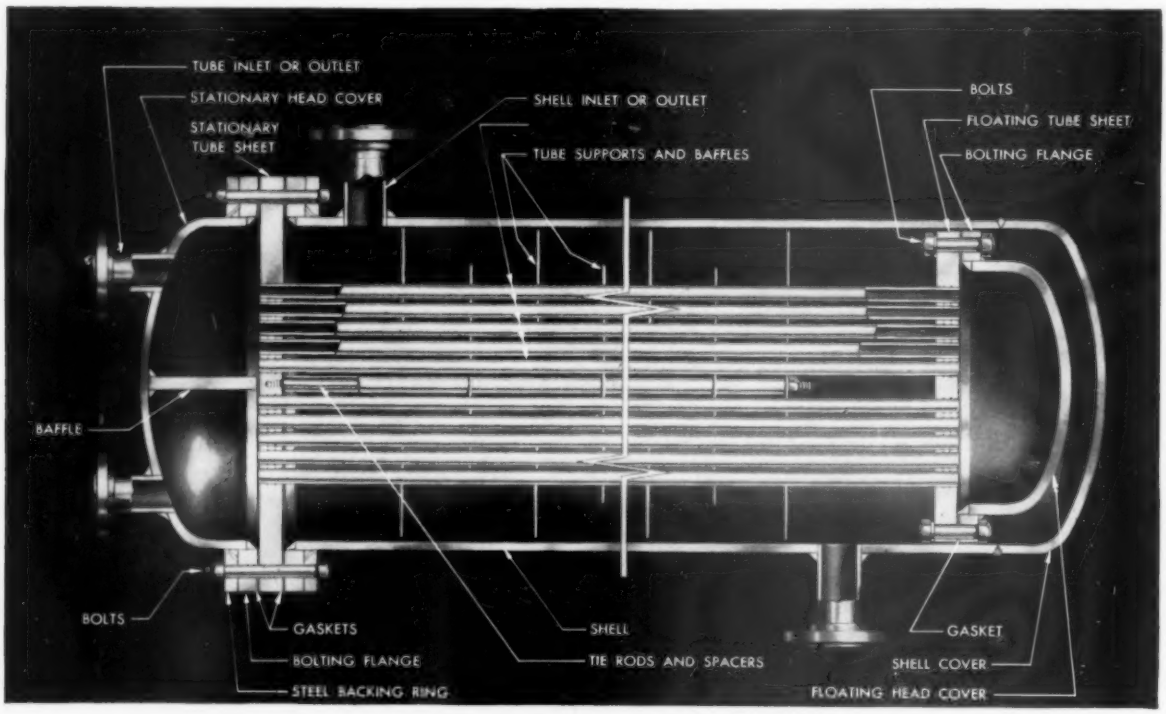
As for cost, ALCOA Aluminum Tube is the most inexpensive. In the common sizes it costs one-third less than mild steel, one-half as much as admiralty, and one-fifth that of stainless.

ALCOA Aluminum alloys are ideally suited to a wide range of maintenance methods. For relatively soft or loose scale, water jets and brushes are usually satisfactory. Wet sandblasting as well as chemical cleaners may be used effectively.

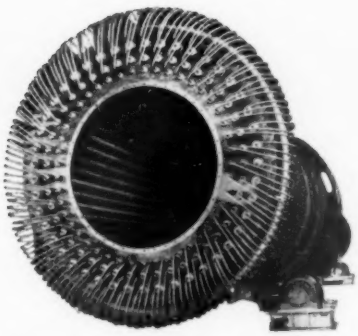
ALCOA engineers have worked closely with all segments of the process industries for over 40 years, and can help you specify the aluminum alloy best suited to your heat exchanger and other process applications. ALCOA's unparalleled experience in this field is available to you for the asking. Write to the address on the coupon, stating your requirements as specifically as possible. ALCOA's development engineers will welcome the opportunity to work with you on your problems.

You can also take advantage of the wide selection of free ALCOA literature on aluminum for heat exchangers and other process applications. Simply check the booklets you want on the coupon and mail to the address indicated. ALCOA will forward your material promptly and without obligation.

ALCOA is conducting a series of engineering conferences on process industries applications of aluminum during 1959 in a number of major cities. Contact your nearest ALCOA sales office for full particulars and dates.



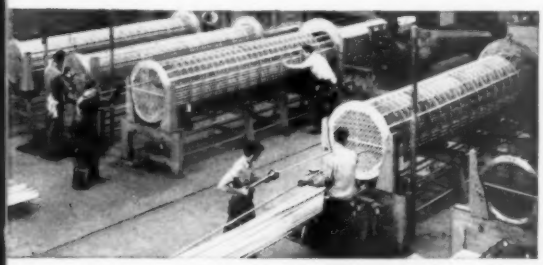
For certain processes where corrosive or sensitive materials are involved, it is often advisable to use aluminum for entire heat exchanger systems to avoid system corrosion and contamination of the product. A typical all-aluminum heat exchanger is shown here. Alloy recommendations are given in the table opposite.



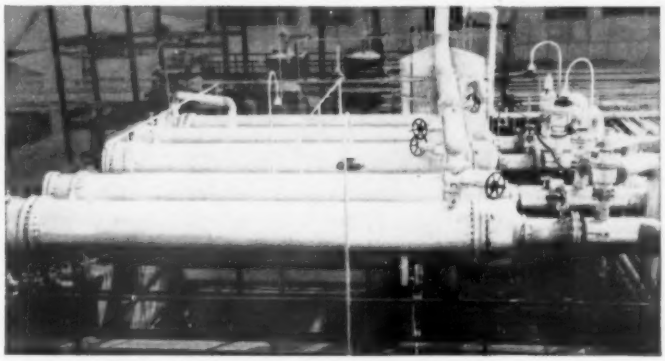
Alcoa Aluminum Tubing protects color in the world's largest rotary steam-tube drier. The drier measures 10 ft in diameter by 100 ft long.

A Midwest utility saved 50 per cent on tubing costs by using Alcoa Aluminum instead of admiralty for tubing in this surface condenser. Successful operation of this unit has led to the installation of similar units by other utilities. This use demonstrates aluminum's economy and superior resistance to ammonia, carbon dioxide and hydrogen sulfide.

A battery of all-aluminum heat exchangers in a polyethylene plant. Selected for initial low cost, these aluminum exchangers provide freedom from product contamination as well as desirable low temperature properties.



Construction of a heat exchanger utilizing Alcoa Aluminum Tube. Superior working properties plus the cold-drawing method by which Alcoa seamless heat exchanger tubes are produced results in close dimensional tolerances and smooth inside and outside surfaces.



This all-aluminum dephlegmator in a large coke plant is used for the regeneration of ammonia liquor in a hydrogen sulfide scrubbing operation. Aluminum tubes lasted five times longer than steel tubes in a similar use.

Alloy Recommendations for Aluminum Heat Exchanger Construction

	Alcoa Designation	ASTM Specification*	Alloy
Tubes	3003-H14	B234	M1A
	Alclad (inside) 3003-H14	B234	clad M1A
	Alclad (outside) 3003-H14		clad M1A
	Alclad (both sides) 3003-H14		clad M1A
	6061-T6	B234	GS11A
	6062-T6	B234	GS11C
Tube Sheets	3004-H112	B178	MG11A
	Alclad 3004-H112	B178	clad MG11A
	6061-T6	B178	GS11A
	Alclad 6061-T6	B178	clad GS11A
Baffles	3003-H14	B178	M1A
	Alclad 3003-H14	B178	clad M1A
Tie Rods	6061-T6	B273	GS11A
Shells & Headers	3003-H112	B178	M1A
	Alclad 3003-H112	B178	clad M1A
	3004-H112	B178	MG11A
	5052-H112	B178	GR20A
	5154-H112	B178	GR40A
Fittings	3003-F	B274	M1A as applicable
	6061-T6	B274	GS11A as applicable
Flanges	6061-T6	B247	GS11A as applicable

*Only the basic number is shown since Alcoa products are manufactured to the latest issue of the specification. The complete number would indicate the year of issue.

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

For exciting drama watch "ALCOA THEATRE," alternate Mondays, NBC-TV, and "ALCOA PRESENTS," every Tuesday, ABC-TV.

Aluminum Company of America
873-C Alcoa Building, Pittsburgh 19, Pa.

Please send me the following literature covering Alcoa Aluminum in heat exchanger and other applications in the process industries.

- ☐ 10186 Alcoa Aluminum Heat Exchanger Tubes
- ☐ 20437 Aluminum Alloy Heat Exchangers in the Process Industries
- ☐ 10460 Process Industries Applications of Alcoa Aluminum
- ☐ 20849 Resistance of Aluminum Alloys to Weathering and Resistance of Aluminum Alloys to Chemically Contaminated Atmospheres
- ☐ 20272 Aluminum Alloys for Handling High Purity Water
- ☐ 20268 Resistance of Aluminum Alloys to Fresh Waters
- ☐ 20935 Designing to Prevent Corrosion

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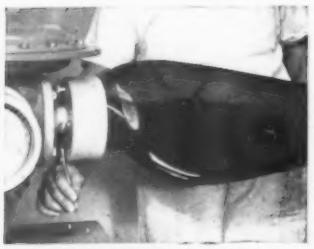
Lightweight.



Easy installation and adjustment.

NEW HUDSON TUF-LITE FANS

After six years of development work and tests of trial field installations operating under wide ranges of conditions in cooling towers, finned tube coolers, and in highly corrosive chemical plant ventilating service, Hudson presents a new product—the TUF-LITE fan. The blades, cast in one seamless piece of fiber glass reinforced synthetic resin, are hollow, light and tough. TUF-LITE fans afford the following advantages over any other available type of fan:

SAFE: TUF-LITE blades being lightweight (about ¼ the weight of other blades with comparable capacity) and infrangible, eliminate the hazards to personnel and equipment existent through accidental throwing or disintegration of heavy metal, wood, or laminated blades while in service.

EFFICIENT: More air is moved at less horsepower because weight and finishing operations do not impose limitations on selections of best aerodynamic design; therefore nearly ideal airfoil cross sections, commercially attainable only in TUF-LITE blades, can be used. Blades will not sag or distort, and surfaces remain permanently smooth.

LOW MAINTENANCE: TUF-LITE blades are unaffected by corrosive, abrasive or impingement effects of hot saturated air, sand, rain, or hail, and have superior deterioration resistance to practically all corrosive vapors or liquids. Blade materials contain color pigment; no painting is necessary. Light weight reduces stress and maintenance on bearings, gears, drive shafts, and supports.

QUIET: The permanently smooth surfaces, very light weight, sustained perfect balance, and advanced aerodynamic design minimize noise.

EASE IN INSTALLATION: Light weight of blades and ingenious design of hub and blade coupling allows attachment of blades by one man using only small wrench. Coupling design assures uniformity of pitch of all blades, and as blades of same size are identical and interchangeable, perfect fan balance is preassured.

In replacement of present fans or in installations on new cooling equipment of any manufacture TAKE ADVANTAGE OF THE OUTSTANDING SUPERIORITY OF HUDSON TUF-LITE FANS.

Bulletin on TUF-LITE FANS
Available upon Request

TUF-LITE protected by U.S. copyrights, patents and patents pending

HUDSON
ENGINEERING CORPORATION
FAIRVIEW STATION • HOUSTON, TEXAS

What's New / IN PROCESSING

Tidewater Oil Co. says it has developed a new premium gasoline that can reduce auto-exhaust smog 5% to 10% in the Los Angeles area.

The new gasoline will eliminate about 50% of the evaporation losses that now occur in the handling and burning of most premium fuels, says H. Y. Hyde, vice-president of research for Tidewater. Hyde admits, however, that the new formula will not solve L.A.'s smog problem or eliminate the need for devices on autos to control exhaust.

The company estimates that if all cars in the Los Angeles basin used the new formula, the 1,000 tons a day of hydrocarbons now released into the atmosphere there would be reduced by about 100 tons a day.

Tidewater says that it will make the technique of manufacturing the new gasoline available without charge to all other refineries in the Los Angeles area.

Hyde says the basis of the new gasoline is a more complicated refining method, which cost the company between $5-million and $7-million to install at its Avon (Calif.) refinery.

Current information indicates that the new Tidewater gasoline still contains about 15% olefins and tetraethyl lead, chemical additives specifically meant to control evaporation.

Present plans call for use of the new processing scheme for Tidewater's premium fuels only. The company says it could be used to make regular gasoline, but that it would be more expensive.

•

The Texas Co. has started building a sulfuric-acid alkylation unit at its El Paso (Tex.) refinery.

The new unit will make 1,600 b/d of alkylate, for use in Texaco's Sky Chief Supreme gasoline.

Completion of the unit is scheduled by the end of the year. The site has been cleared, and contracts have been awarded for many phases of construction, according to R. R. Chase, superintendent of the El Paso works.

•

A new type of all-synthetic hydraulic fluid, based on halogenated hydrocarbons, has been announced by Monsanto Chemical Co.

The company describes it as the first fluid of this type to be developed for fire-resistant use in hydraulic systems. Called Pydraul A-200, it is said to have high resistance to compression, excellent lubricity, and good stability, and to be compatible with all other commercially available all-synthetic hydraulic fluids.

•

The Atomic Energy Commission has awarded a $50,000 research and development contract to Goodyear Tire & Rubber Co. to develop industrial applications of isotopic dating methods.

Goodyear will undertake to establish dating techniques that will be of value not only to the rubber industry, but to many other industries as well.

Possible applications for isotopic dating techniques include checking the length of time for which items have been stored; determining the age of all kinds of returnable containers; and, in the field of preventive maintenance where replacement could be made before failure, determining the average age of articles in actual service.

The amount of isotopic radiation needed to compute the age of an item is very small, of the same order of magnitude as natural background radiation. The technique has been made possible by recent development of ultrasensitive low-level counting devices.

•

Two new steam generators will be installed at the Port Credit (Ont.) refinery of Regent Refining (Canada), Ltd.

The estimated cost of the generators is $560,000. The full program calls for the installation of the two 50,000-lb.-per-hour outdoor-type steam generators, plus the construction of a new boiler house on the eastern boundary of the property, and relocation of the two existing boilers and auxiliary equipment now on the site of the proposed boilerhouse.

•

Humble Oil & Refining Co. has awarded Hudson Engineering Corp. the contract to design and engineer Humble's mammoth King Ranch (Tex.) gas plant. The plant, now expected to be on stream in early 1960, will be able to process up to 600-million cu. ft. of gas daily.

The V.P. said,

"STOP

. . . Stop right now, if you're trying to tell me there's anything different about your cobalt moly catalyst."

That's the kind of talk we like.

Sure, we believe in recommending our own product . . . for desulfurization, denitrogenation, hydrogenation of olefins, in the hydrotreating of naphtha feeds to reforming processes, and other general hydrotreating service. But we not only recommend it, we can give you some unique assistance in making sure you're getting all the return you can.

As process designers, our people know your problems and can fully understand your special requirements. From actual experience in industry, they know the importance of details so often forgotten, such as handling costs, storage problems, and special information for your processing personnel.

Catalysis is a way of life with us. Tell us your requirements, and let us prove it to your advantage.

*

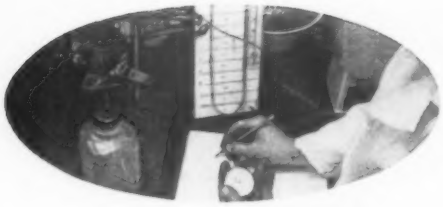
HOUDRY

CATALYSTS

HOUDRY PROCESS CORPORATION

1528 Walnut Street, Philadelphia 2, Pa.

*Houdry means Progress . . . through Catalysis



A look at today...and a glimpse

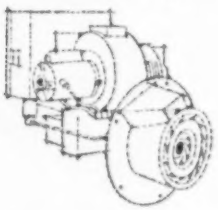
Armour Chemicals for Refined Products

Where they work today

Fuel oils—gasolines—asphalts. Every major area in refining can profit from Armour Chemicals. There is a variety of economical, oil soluble, cationic chemicals for each special job. Some function as additives for direct use in finished products; others are ideal as corrosion inhibitors during processing; still others perform as versatile chemical intermediates in the making of new products.

Fuel Oil Additives

The Armolads® are Armour's series of special furnace oil additives. They have been proved efficient at costs of less than 1¢/bbl.—making them the most economical fuel oil additives now being offered refineries.



All the Armolads are ashless additives. They are of the inhibitor-dispersant type and will impart corrosion inhibiting properties.

Armolads are fatty amine derivatives and are 100% active. It has been proven that the Armolads will effectively stabilize oil against insoluble gum formation and color degradation, and improve filterability without promoting emulsions in furnace oils from various crude sources.

Physical characteristics

	Pour Point	Specific Gravity
Armolad F22	28°F	0.857 at 79°F
Armolad F24	64°F	0.856 at 79°F
Armolad F25	62°F	0.835 at 84°F
Armolad F26	38°F	0.822 at 79°F
Armolad F28	52°F	0.840 at 79°F
Armolad F20	Melt Pt (approx) 115°F	0.797 at 138°F

Comparison tests (Mid-East stock)

	12 months ambient storage Mg/liter	DuPont's 13 week test Mg/liter	UltraViolet light test Mg/liter
Control	134	36.0	64.5
Armolad F22	68	4.0	20.5
Armolad F20	74	4.0	23.5
Competitor M	139	102.5	23.5

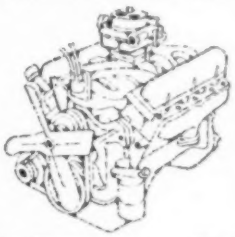
All crude stocks—Mid-Continent, Mid-East, West Texas, and Venezuelan—can be improved by one of the Armolads.

Armour will recommend a specific Armolad for the crude oil you're processing and help you determine the optimum concentration needed to do a satisfactory job economically.

For more information on the entire series of Armolads, check "A" in the coupon.

Gasolines

Armour Chemical offers refiners several chemicals that have found wide acceptance as gasoline additives. Both the Armeens® and Duomeens® are used as anti-stalling additives.



The Armeens . . . $R(NH_2)$—are high molecular weight aliphatic amines. They are cationic surface active agents and have the ability to change surfaces from hydrophilic to hydrophobic.

The Duomeens . . . R $(NH)CH_2CH_2CH_2(NH_2)$ . . . are Armour's series of N-alkyl trimethylene diamines. They are prepared according to the following reaction:

$$RNH_2 + CH_2{=}CH_2\ C{\equiv}N \xrightarrow{H_2} RNHCH_2CH_2CH_2NH_2$$

The Armeens and Duomeens are excellent corrosion inhibitors. Both can be reacted with various organic or inorganic acids to give you additional versatile additives which will impart the following characteristics: (1) excellent detergency, (2) improved thermal stability, (3) increased lubricity.

For more information on the Armeens and Duomeens as they are applied in refinery applications, check "B" in the coupon.

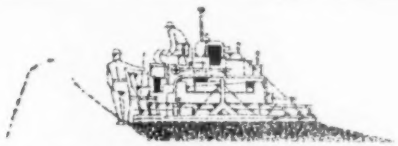
Asphalts

If you have an additive requirement when marketing asphalt, it will profit you to know more about the Redicotes® and Duomeen T. Armour's chemicals for this area of refining are designed to help you make treated asphalt that will pass difficult state stripping tests. They're effective at concentrations as low as 0.2%. Even at such a low concentration they im-

# of tomorrow

from Armour Chemical

prove adhesion of asphalt to damp or wet aggregates, permitting contractors and highway departments—your customers—to extend their paving season.



Many asphalt plants and refineries are using Duomeen T or Ethoduomeen T/13 as a starting material for making their own asphalt adhesion agents. Let Armour's technical staff assist you in formulating your own anti-stripping additive.

Chemical-physical properties of Redicotes

(Salts of Polyamines derived from tallow)

Redicote	Pour Point	Typical SSF Viscosity	Typical Sp. Gr. @ 20°C	Per Cent Active
76	120°F	25 (@ 140°F)	0.859	100
77	110°F	45 (@ 122°F)	0.875	100
79-S	105°F	40 (@ 122°F)	0.894	100
80-S	60°F	127 (@ 122°F)	0.940	100

For additional data, check "C" in the coupon.

Where Armour Chemicals for refineries will work tomorrow

In fuel oils. More efficient dispersants and stabilizers for the heavier fuel oils are being developed by Armour for the refining industry. Results have been encouraging and will be announced in the near future.

In gasolines. Armour is currently developing new poly-functional materials to make gasoline engines run cleaner. Work is progressing with additives to improve engine performance all year-round.

In emulsion-grade asphalts. Armour has new information available on cationic emulsifiers that are insensitive to hard water; that promote better adhesion on all types of aggregate; and that can be used at economical concentrations with asphalt from any crude source.
For laboratory progress report, check "D" in coupon.

Find out how Armour's chemicals for refineries can work for you. Our chemical specialists will help you utilize the right additive or basic chemical for your products or special situation. Write or call Armour today.

NEWS NOTES

London, England. A new, improved corrosion inhibitor has been developed for application in both refinery streams and in metal working oils. The inhibitor is formed by reacting an Armour diamine with wool grease olein.

•

Hamburg, Germany. Difficult performance specifications now required by growing industrial demands have been met by incorporating an Armour amine into crankcase lubricants and an Armour diamine into diesel oils.

•

Cleveland. Increased die life, cleaner surfaces, the elimination of breaks, and the stopping of chattering is being accomplished by oil soluble diamine salts at one of the large tube manufacturers in this area.

•

Wilmington, South Carolina. Within the past month, new asphalt test roads have been laid here from finely dispersed, stable cationic emulsions. The emulsions were prepared with Armour's cationic surfactants.

•

San Francisco. Drum corrosion is being effectively combatted by an Armour diamine at concentrations of ½ to 1% in a product consisting of phenolic and chlorinated chemical dissolved in kerosene.

How can Armour Chemicals help you?

Check here for more information on your field of interest. ☐ A ☐ B ☐ C ☐ D

Send sample and more information for this application:

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Brazil Rules Out Foreign Oil Capital

SAO PAULO—Brazil last week slammed the door on prospects of any direct participation by U.S. capital in its oil development plans (PW—Feb.6'59,p50).

President Kubitschek approved new restrictive regulations drawn up by the National Petroleum Council for the projected private Brazilian exploration venture in Bolivia.

The new rules are a reversal of politically controversial recommendations by Brazil's Development Bank. They underscore the strength of nationalist influence in the government.

U.S. companies were originally slated to back three private Brazilian groups, whose proposals for the Bolivian venture had been unconditionally approved by the Development Bank. The bank had given only provisional approval to two other Brazilian groups, which had failed to come up with adequate foreign backing.

U.S. backing for the Brazilian exploration venture in Bolivia will be difficult under the new regulations, which rule out government guarantees for foreign financing.

The government will accept no responsibility for supplying foreign exchange. Investment risk for the Bolivian venture will not be covered by the government in any way, whether directly or indirectly.

Under the new ruling, foreign exchange will be available only through swaps, through any foreign financing made available without participation, through direct purchases on the free market, or at exchange auctions.

Only one of the three groups approved earlier by the Development Bank—Uniao Brasil Bolivia—had originally proposed swap financing, with Anderson Clayton, backed by a services contract with Kerr-McGee Oil Industries, Inc. Under the new ruling, it appears that this group now has some advantage.

In the other two cases, the U.S. companies had agreed to put up risk capital that would be repayable if oil was found, thus having direct stakes in the ventures. One was the T.U.L.M. Group, which offered to put up $9-million. The other was Pan American Land & Oil Royalty Co., of Dallas (PW—Jan.30'59,p38).

The new regulations also provide that all five Brazilian groups that originally made proposals for the Bolivian venture receive equal treatment.

This eliminates the controversial preferential position accorded by the Development Bank to the three groups that had lined up U.S. backing.

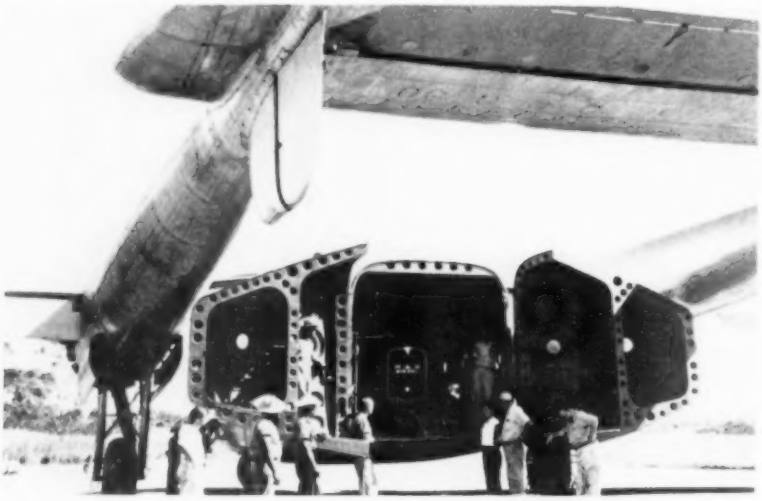
The regulations also provide that all services or technical-assistance contracts must be approved by the National Petroleum Council.

The new ruling is a victory for Brazilian nationalists, who fear that successful partnership ventures with foreign oil capital in Bolivia would pave the way for similar operations in Brazil itself.

As such, it virtually eliminates any likelihood that Brazil will relax its state monopoly of oil exploration and development, even to the extent that Argentina has done.

The prospect now is that insufficient capital resources will restrict the Brazilian venture in Bolivia, though all five groups will probably be able to raise enough funds to get started before a September deadline ends Brazil's treaty rights on Bolivian acreage. With foreign risk capital now effectively shut out, and local credit very tight, the prospects for fast development look dim.

This, in the view of Brazilian critics of the government's new move, almost defeats the object of the Bolivian venture. Bolivia, for its part, also may not be happy about Brazil's shutting out foreign participation, since it wants rapid development for the added income.



Giant Airlift Gets Guatemala Test Started

Ohio Oil Co.'s first Guatemala wildcat was spudded this week after a giant airlift of equipment into the trackless rain forests of Peten (PW—Oct.10'58,p44). Some 6-million lb. will have been flown in by the time the 13,000-ft. test is completed by International Brown Drilling Co. for Ohio Oil's joint account with Amerada Petroleum, Continental Oil, and Union Oil of California.

Equipment, including drawworks for the National 110 rig (right) was shipped from Houston sectionalized in 16,000-lb. loads, capacity of the three C-82 Flying Boxcars (above) that flew it 110 mi. inland to Ohio Oil's airstrip. It was then trucked to the well site over a 6-mi. switchback road.

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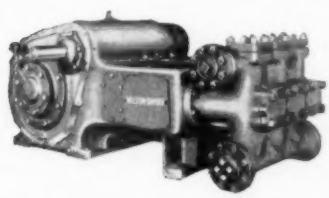
Since 1878, the Wilson-Snyder trade name has been synonymous with the highest quality in heavy-duty pumps. Their performance records in thousands of refinery installations throughout the United States and in foreign countries have established them as the industry's finest pumps.

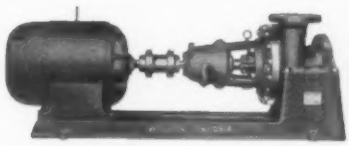
While centrifugal pumps are widely used for process work, there are specific applications for which reciprocating pumps offer definite advantages from the standpoint of both performance and economy.

As a manufacturer of both centrifugal and reciprocating types (including both power-driven and direct-acting steam-driven), you can be sure our unbiased recommendation will be the type best suited for your specific applications.

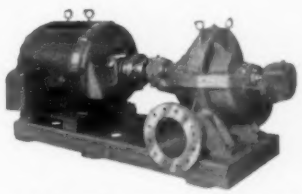
Here are Four Popular Types



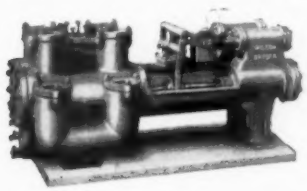
TRIPLEX PLUNGER-TYPE POWER PUMPS . . . Designed for handling a wide range of products, including highly volatile liquids over a wide temperature range, and time-proven in high-pressure charge pump service. Available in 4", 6" and 8" stroke sizes for capacity requirements up to 500 GPM and pressures up to 5,650 psi.



ES CENTRIFUGAL PROCESS PUMPS . . . Single or two-stage heavy-duty type for elevated temperature applications to 900°F., employing vertically split case and single stuffing box for conventional packing or mechanical seal of your choice. End suction, as illustrated, is standard construction—can also be furnished with top suction when preferred. Twenty sizes provide capacities from 15 to 2,000 GPM, 50 to 1100-ft. head, 2 to 250 HP.



DOUBLE SUCTION CENTRIFUGAL PUMPS . . . Single-stage heavy-duty type for temperature applications to 300°F., employing horizontally split case with impeller mounted between bearings. Side suction and side discharge arrangement is standard—bottom suction arrangement is available in 14" and larger sizes. Fourteen sizes provide capacities from 100 to 30,000 GPM, 20 to 300-ft. head, 5 to 1,500 HP.



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Venezuelan Labor Outlook Seems Smooth

CARACAS—Amicable agreements with unions representing 8,000 Paraguana oil workers have been reached by Venezuela's three top producers, in what is regarded as a warm-up for industry-wide negotiations for renewal of three-year labor contracts that will expire in September.

The settlements were reached by Creole Petroleum Corp., Cia Shell de Venezuela, and Mene Grande Oil Co. on a series of demands presented by terminal and refinery workers on the peninsula.

The local settlements are not of major importance. But the friendly atmosphere in which talks were conducted appears to augur well for continued good relations.

The issues involved such items as house rents, travel time, and dock-worker pay. Creole and Shell agreed to reinterpret travel-time allowances for some refinery personnel, mostly shift workers. Creole also reduced rents to around $6.50 and $8 monthly on about 240 houses that formerly rented for about $28.

All three companies raised wages slightly for hose-handlers on loading docks, and several other minor claims were settled.

Settlement of some claims is still pending. One primary demand, involving a half-hour of lunchtime pay, was turned down by the three companies and left to a Labor Ministry fact-finding commission.

The Venezuelan Federation of Oil Workers carried some other claims to Caracas for talks at the Labor Ministry. The move is interpreted as an effort to boost union membership in preparation for industry-wide contract bargaining, since the claims could probably have been settled on the local level.

The revival of workers' union interest that was anticipated after the 1958 revolution in Venezuela has only partly materialized. To date, only about 60% of the potential oil union membership has been signed up.

Meanwhile, some grumbling has followed the Paraguana settlement. Federation leaders have had to put down dissension in local union ranks over what some workers consider too conciliatory an attitude. The Federation charges that a distorted version of the accord was publicized to discredit union leaders. But it also admits that some local unionists had raised exaggerated expectations among the workers.

- *has an area of 586,400 square miles*
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- *was discovered by a Dane, Vitus Bering, in 1741*
- *has a 6,640-mile coastline*
- *has, as its approximate geographic center, a point in latitude 63° 46', longitude 152° 20'*
- *has produced some oil since the early 1900's*
- *has, as its state flower, the Forget-me-not,*

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150-Mi. Ghawar Field Is Still Growing

Saudi Arabia's Ghawar field—already more than 150 mi. long—may be extended again by a test now being drilled by Arabian American Oil Co. to delineate the new Fazran area.

The Fazran extension was discovered in 1957, 12 mi. north of Ghawar's northernmost well, by No. 56 Ain Dar—later renamed No. 1 Fazran. No. 2 carried it another 6 mi. north. No. 3 is now being drilled 4 mi. north of No. 2.

At other new discovery areas: Offshore, Aramco will soon resume drilling in No. 3 Manifa. No. 1 and No. 2 Manifa were completed as Ratawi zone producers. Onshore, Aramco has just abandoned its sixth test at Khursaniyah, where it has three Arab zone producers. And far inland, it is completing its fourth producer at Khurais, also in the Arab zone.

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THREDLOK 801 is a new compound that seals and locks casing joints tightly and permanently. It offers an easy, economical alternative to welding for bonding the bottom two or three joints in a casing string to prevent casing breakout during rotary drilling.

Extensive use in the field has proved that THREDLOK provides stronger joints than tack-welding. It eliminates the possibility of damage to high-strength casing that may result from welding alloy pipe. And where welding the first two or three joints in a casing string costs approximately $50 to $75, THREDLOK gets the job done for about $6.00.

THREDLOK 801 is available in pound cans, @ $3.00 per lb., at Humble wholesale plants throughout Texas and New Mexico. THREDLOK is also available through many oil field supply stores. Call the one nearest you, or phone or write:

Humble Oil & Refining Company
Consumer Sales, P. O. Box 2180
Houston 1, Texas

How to use

- Remove couplings, carefully clean and dry both male and female threads.
- Mix contents of THREDLOK can, pour converter into can and stir thoroughly.
- Apply THREDLOK to male and female threads with paddle or putty knife, making sure the threads are completely covered.
- Make the joint up immediately. It can then be run into the hole without delay.

HUMBLE

What's New / AROUND THE WORLD

FRANCE—Plans for the Mediterranean-Rhine pipeline are still unsettled, although France last week agreed in principal to construction of the French part of the line—a 419-mi. segment from Lavera to Strasbourg (PW—Mar.13'59,p8).

The question of the extension to Karlsruhe, Germany, is still up in the air. Financing plans are also unsettled. The 30-in., 200,000 b/d line is being studied by a 19-company group including international majors and French and German companies.

•

INDIA—The government has budgeted $31.5-million for oil exploration and development during the next fiscal year, starting Apr. 1.

Less than half of the total will go to the Oil & Natural Gas Commission for its own exploration program. The remainder will be divided: $4.2-million to the Indo-Stanvac joint venture; $4-million to Oil India Private, Ltd.; $3.6-million to Indian Refineries, Ltd.; and $6-million to the Geological Survey of India.

•

ARGENTINA—The state oil agency is suspending imports of Soviet oil because the original price tag is now higher than recently-cut world market prices.

A trade deal concluded last year covered a total of 1-million tons, priced at $2.32 per bbl. c.i.f. The half deliverable last year was covered by a $7½-million trade surplus.

The half that was scheduled for delivery this year was to be paid for in Argentine wool. The Soviet Embassy in Buenos Aires is said to have delivered a strong protest against the decision.

•

POLAND—The government has allocated $40-million for oil exploration this year. Most of the work will be done in the southeastern provinces, where 112 tests are slated, including completion of 57 started last year.

•

SPAIN—Some 13 oil companies are now reported interested in getting oil rights under Spain's new 50-50 oil law (PW—Jan.16'59,p66).

The companies, most of which are interested in Spanish Africa, include Jersey Standard, Indiana Standard, Caltex, Sun Oil, Banff Oil of Canada, the Conorada group, Phillips Petroleum, Gulf Oil, General American Oil Co. of Texas, Shell, and three Spanish companies.

•

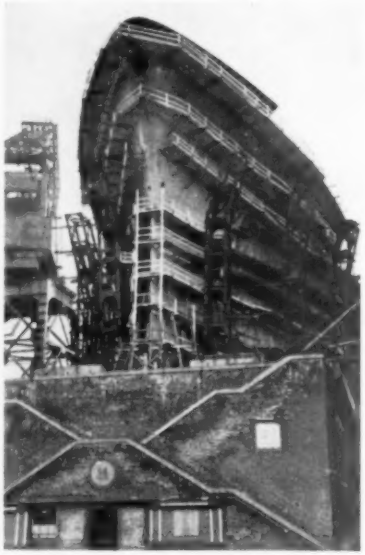
INDIA—The government is considering a move into marketing, a sphere in which it apparently sees eventual state control, according to recent statements by Prime Minister Nehru.

The ostensible reason for the state agency proposed now is that New Delhi needs the experience in anticipation of marketing products from its two projected refineries.

•

MEXICO—Fluor Corp., Los Angeles, is getting a $50-million contract from Petroleos Mexicanos to design and set up its first petrochemical installations: three 200-ton-daily ammonia plants, to be installed at Minatitlan, Salamanca, and Torreon (PW—Jan.9'59,p41).

The contract will also cover installation of a Platformer-Udex facility at the Minatitlan refinery, Fluor told shareholders last week.



New Russian Tanker

The Soviet Union's second 40,000-ton tanker is now under construction, following the recent launching of the "Peking" (above), biggest ever built in Russian shipyards. "A number of" additional 40,000-ton and 25,000-ton tankers are slated to be built in Leningrad under the seven-year plan ending in 1965.

•

RUMANIA—Western oil equipment manufacturers may face increasing competition from Rumania this year.

The Rumanian industry, which exported 40% of its 1958 production, will increase output 14% in 1959, according to the state news agency. Argentina was among new customers in 1958.

•

EGYPT—Two West German firms last week were granted a $15-million government contract to build product pipelines on extended payment terms.

Cairo will pay 12½% immediately in exports of cotton to Germany and the rest over eight years at 5% interest. The companies—Mannesmann Export GmbH and Phoenix-Rheinruhr AG—will lay the lines, with branches, from the Mex refinery, near Alexandria, to Tanta, and from a Suez storage depot to Cairo.

•

VENEZUELA—Production on Lake Maracaibo Block 4—started last October—now totals 25,000 b/d from 11 wells completed so far.

One exploratory test and two development wells are currently being drilled on the mid-lake block, owned 50% by Signal and 25% each by Pure Oil and Standard of Ohio. Each is disposing of its own share of production, which averages 36.5-gravity and has the lowest sulfur content of any lake crude.

•

BAHAMAS—The offshore wildcat at Cay Sal Bank is now down to 18,600 ft., with drilling being continued (PW—Feb.13'59,p42).

Crews are working two weeks on and two weeks off on the wildcat, a joint venture of Standard of California and Gulf Oil. It was originally planned for 15,000 ft.

•

FRENCH SAHARA—A private Italian company and its French part-

From LIBERTY TECHNOLOGY
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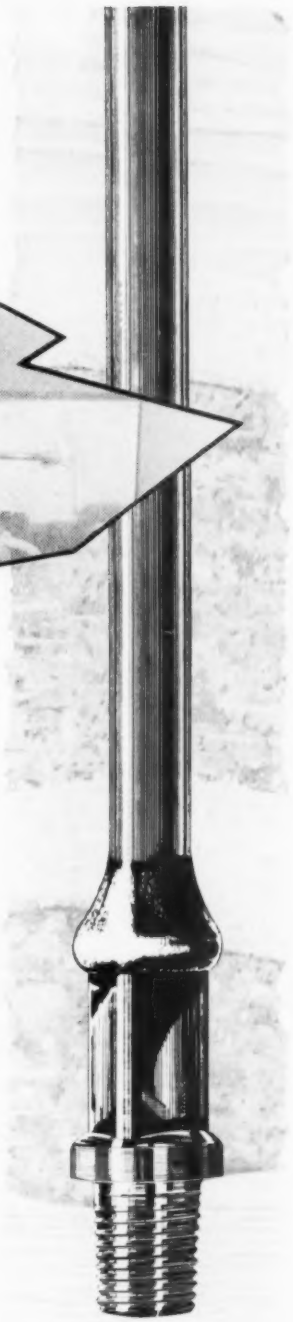
to reduce the cost of pumping oil



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AMERICAN IRON & MACHINE WORKS CO. INC. — MANUFACTURERS OF OILFIELD EQUIPMENT — A — OKLAHOMA CITY

ner have been granted their second permit in the Sahara (PW—Sep.12 '58,p13).

The five-year Hassi Leila permit, covering 2,240 sq. mi. about 150 mi. southwest of Hassi Messaoud, requires a minimum investment of $3.2-million. It went to Ausonia Mineraria, exploration subsidiary of Italy's Edison group, and the French government's Petropar.

They also were granted the 734-sq. mi. Taouratine permit, near Libya, last year.

•

INDIA—An unidentified Indian firm has applied for a license to import Rumanian products.

Under pressure from the Communist party, the government says it may grant the license—for 19,000 tons of kerosine and 6,000 tons of diesel oil—if the cost is lower than that for Persian Gulf products.

•

ITALY—Esso Standard Italiana sold 120,000 b/d of oil products in 1958, with a total value of $372.8-million. This includes $192-million in product taxes.

The $68-million earned on exports, which topped 50,000 b/d, plus the $27-million spent in Italy by Esso companies, contributed $95-million to Italy's dollar reserve. This almost balanced the $100-million spent by Esso for crude purchases.

•

ALBANIA—The original 1959 crude output target of about 20,000 b/d has been halved. Reason: 1958 production dropped 17% below 1957, to 8,080 b/d.

•

WEST GERMANY—Weatherford Oil Tool Co. has set up headquarters for Eastern Hemisphere operations in Hannover. Initially, it is offering cement engineering and hydraulic casing tong services in Germany. Eventually it will manufacture, sell, and service oil field equipment.

•

ITALY—A new company, capitalized at $1.6-million, has been formed to build the Italy-to-Switzerland pipeline (PW—Feb.20'59,p108).

Italy's state-owned Ente Nazionale Idrocarburi has a ⅔ interest in the new Oleodotti Internazionale (International Oil Pipelines), and Soc. Financiere Italo-Suisse has ⅓. ENI's Enrico Mattei, is president and Swiss banker Salvador Amon vice-president.

•

VENEZUELA—It's Mobil Oil Co. de Venezuela now—the new corporate name for Socony's Venezuelan subsidiary. It was formerly Socony Mobil Oil Co. de Venezuela.

•

WEST GERMANY—Product output this year is expected to climb 42%, 2-million tons, AEV, the producers' and refiners' association, estimates. It breaks down the output as follows: 7.9-million tons of heating fuel; 4.3-million tons of gasoline; 4.1-million tons of diesel fuel; 900,000 tons of asphalt; 600,000 tons of heating gas; 500,000 tons of liquid gas; 500,000 tons of turbine fuel; and 400,000 tons of lube oil.

•

Correction

The company holding exploration rights in Surinam is a subsidiary of Gulf States Land & Industries, Inc., of New Orleans—and not of Marts Oil Co. (PW—Mar.6'59,p18). Gulf States acquired 80% of Colmar-Surinam Oil Co., Ltd., last summer.

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Oil Company Presidents

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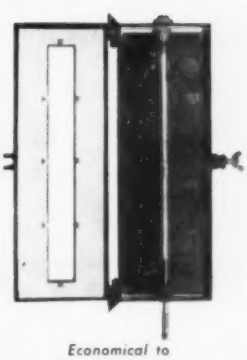

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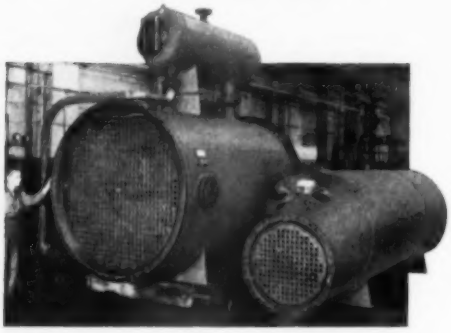
1 A nitric acid plant installed this unit. It has a built-in platinum catalyst chamber.



2 A methanol plant operates these horizontal type units.

5 TYPES OF Waste Heat STEAM GENERATORS

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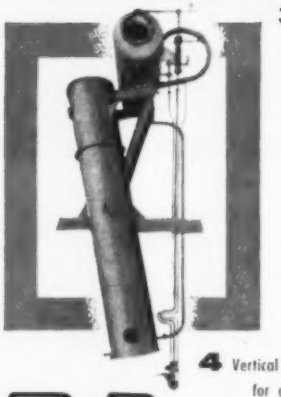
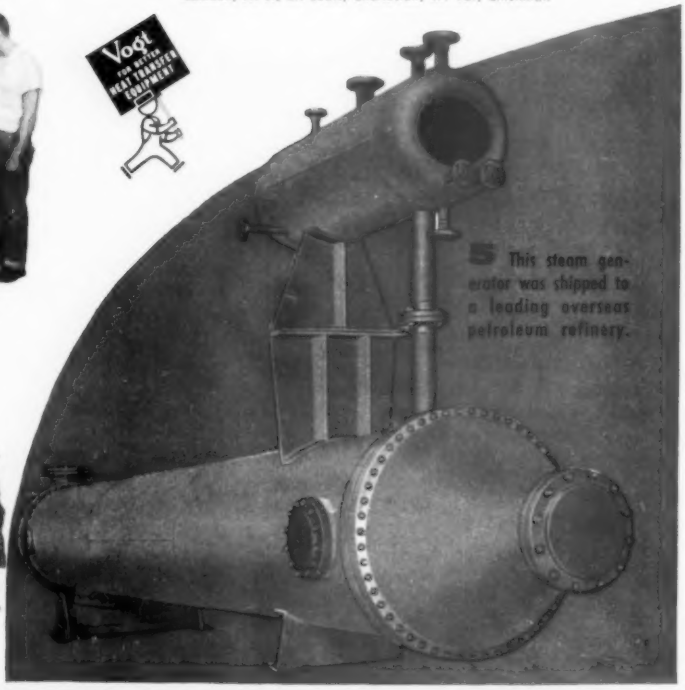
SALES OFFICES: New York, Chicago, Cleveland, Dallas, Camden, N. J., St. Louis, Charleston, W. Va., Cincinnati

3 Horizontal unit for a nitric acid plant.



4 Vertical type unit for a hydrogen plant.

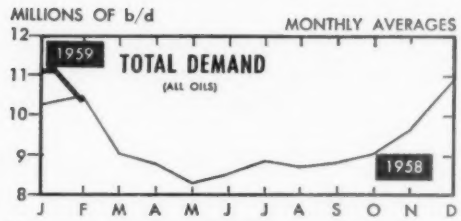


5 This steam generator was shipped to a leading overseas petroleum refinery.

Vogt HEAT TRANSFER EQUIPMENT

PETROLEUM WEEK'S

Fingertip Figures

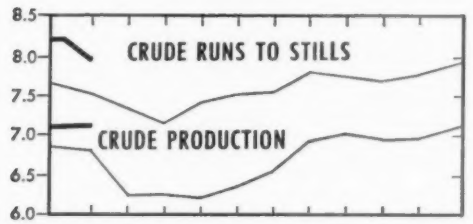


TOTAL DEMAND

Latest 4-week average	10.184
Year ago	10.197

DISTILLATE DEMAND

Latest 4-week average	2.917
Year ago	3.201

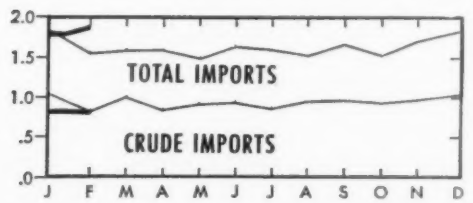


RUNS TO STILLS

Latest week	8.283
Previous week	8.207
Year ago	7.479

CRUDE PRODUCTION

Latest week	7.127
Previous week	7.213
Year ago	6.257

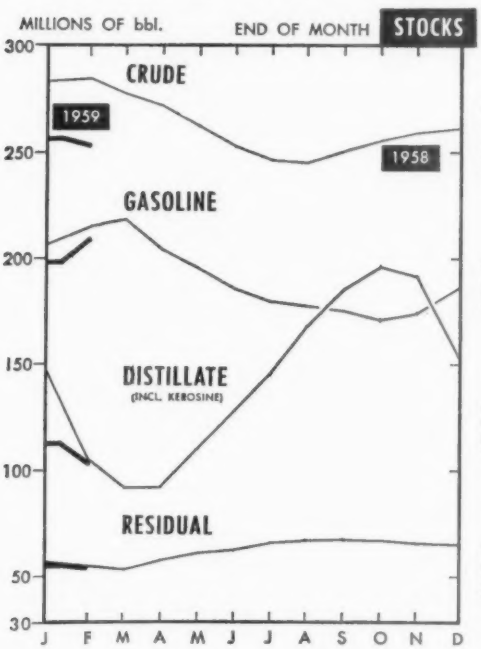


TOTAL IMPORTS

Latest week	1.738
Previous week	2.629
Year ago	1.525

CRUDE IMPORTS

Latest week	.805
Previous week	1.331
Year ago	.856



CRUDE STOCKS

Week-ended 3-7	256.0
Previous week	259.1
Year ago	286.0

GASOLINE

Latest week	210.3
Previous week	207.0
Year ago	216.5

DISTILLATES

Latest week	97.9
Previous week	99.6
Year ago	99.4

RESIDUAL

Latest week	55.0
Previous week	54.8
Year ago	55.1

It is now almost certain that the industry will be faced with surplus stocks of refined products—particularly gasoline—for the remainder of the year.

The reason is that with present—and most likely future—import allocations tied to a percentage of runs, refiners will be encouraged to maintain high runs to create "a favorable run history," as one processor puts it.

Refinery runs so far this year have been a little higher than expected—a situation that could be corrected with "normal" seasonal cutbacks this spring and summer.

"Current inventory levels, and the outlook for demand over the next few months, indicate the need for reduced output of all principal petroleum products," according to John G. Winger, petroleum economist of the Chase Manhattan Bank.

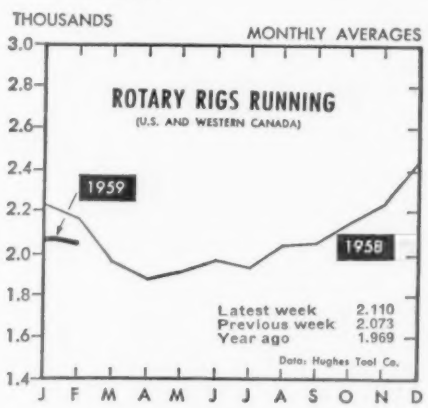
The need for a seasonal cutback, he warns, applies to domestic crude production and imports, as well as to refinery operations.

Gasoline yields in February, Winger notes, were reduced about one percentage point from January, to 48.5%. "But this action alone was not sufficient to stem the excess production of gasoline."

And while demand for the year to date has been running about as expected, the predictions are for a seasonal decline of about 1.4-million b/d in demand for the April-through-June period.

If such estimates prove true, a reduction of about 300,000 b/d in the present rate of refinery runs could be made and still provide enough of a distillate stock build-up for next fall, and ample gasoline for the summer.

If demand drops more than expected in the next quarter, an even deeper cut in runs would be needed to prevent serious oversupply.



The Market Trend

AT-A-GLANCE

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PETROLEUM WEEK

Gulf and Caribbean Prices Due to Split

Be on the lookout for Caribbean prices to make the break with product prices at the U. S. Gulf. The President's proclamation on imports points in this direction.

Caribbean refiners have paid lip service to U. S. Gulf prices for time out of mind. Today, posted spot prices of Caribbean refiners are identical with Gulf Coast prices on all principal products.

In fact, Caribbean sellers followed the Gulf Coast long after the latter area ceased to be an export center. With the temporary exception of the Suez Crisis, the Gulf lost its eminence as an export center around 1948.

Strains were bound to develop in any stylized system of pricing, particularly as Caribbean sellers catered to markets not reached by the Gulf. Contract gasoline sells for about 2¢ off spot posted in the Caribbean, a price few Gulf Coast sellers would consider meeting on domestic crude. Heavy fuel oil is a staff-of-life product in the Caribbean, but it is a negligible item of export at the Gulf.

The President's action on imports will complete the divorcement between the two areas. Caribbean gasoline and distillates will be shut out of U. S. markets—except in very small quantities. Jet fuel sales and residual sales to the U. S. from the Caribbean also will be made on a controlled basis.

Here's how the break probably will shape up. Gasoline prices very shortly will probably trend higher in the U.S. Gulf, and lower in the Caribbean. On the other hand, kerosine prices are strong enough to rise in the Caribbean, but will probably slough off in the Gulf. And bunker "C" fuel prices in the Gulf will probably tend to be stronger than those in the Caribbean.

Another likely difference is that Caribbean product prices will follow trends in Venezuelan crudes. Up to now, Caribbean products have followed the Gulf regardless of changes in Venezuelan crudes (except for heavy fuel).

A Mixed Reaction: The price moves immediately after the imports announcement were mixed. Gasoline tank car prices slipped 0.4¢ to 0.5¢ a gal. at Savannah and Charleston. Tank wagon prices were hiked 0.8¢ in Chicago.

U.S.-Flag Tankers: Shipping men feel that U.S.-flag tanker rates will firm up somewhat as a result of import curbs. On the other hand, foreign tankers—both clean and dirty—will be in trouble. The day after the President's announcement, clean consecutive foreign-flag tonnage was offered as low as USMC—48%.

'Captive' Customers: A wrinkle in the imports order is that East Coast residual accounts may be split between "free" accounts and "captive" accounts. It all depends on who was the importer in name. Customers of one large Caribbean refiner imported fuel oil in their own names. Now they will get the quotas. On the other hand, a second large refiner used to bring in fuel oil as the importer of record, and then sell to the customers here. So the quota will be in his name.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of March 16

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, cargoes
- Gasoline, 98 oct prem. ... 11.75-12.75
- Gasoline, 92 oct reg. ... 10.5-11.5
- Kerosine ... 10.375
- Heating oil, No. 2 ... 9.875
- Gas oil, 48-52 d.i. ... 10.125
- Fuel oil, bunker "C" ... $2.00-2.10

Caribbean, cargoes
- Avgas, Grade 100/130 ... 16
- Gasoline, 93 oct research prem ... 10.75
- Gasoline, 87 oct research reg ... 9.875
- Gasoline, 79 oct research ... 9.125
- Gasoline, 70-72 oct motor method ... 9
- Kerosine ... 10.625
- Heating oil, No. 2 ... 9.875
- Gas oil, 48-52, d.i. ... 10.125
- Fuel oil, bunker "C" ... $2.00

New York Harbor, barges
- Kerosine ... 11.5
- Heating oil, No. 2 ... 11
- Fuel oil, No. 6 ... $2.37-2.45

Okla-Group 3, northern shpt., bulk
- **Gasoline, 89 oct reg ... 12↑-12.5↑**
- **Kerosine ... 10.75↓-11.125↓**
- **Heating oil, No. 2 ... 9.75↓-10**
- Fuel oil, No. 6 ... $1.90-2.00

Chicago, bulk
- **Gasoline, 91 oct reg ... 11.5-12↑**
- Heating oil, No. 2 ... 10.5-11.85
- Fuel oil, No. 6 high sulfur ... 7.65-7.75

Los Angeles, rack
- Gasoline, 88 oct reg ... 12.15-12.6
- Diesel fuel, PS 200 ... 8.5-11.25
- Light fuel, PS 300 ... $2.80
- Heavy fuel, PS 400 ... $2.15-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3 ... 4.5
- FOB Breckenridge, Tex. ... 4

LP-Gas
- Propane, Oklahoma (Group 3) ... 5.5

Pennsylvania Lubes
- Bright stock, 25 p.t. ... 22
- 200 vis. neutral, 25 p.t. ... 21

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent 95 v.i. ... 23-24
- Neutral, solvent, 200-210 vis. ... 19.5-20.5

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. ... 24
- Neutral, solvent, 200 vis. ... 20.5

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130 ... 17.25
- Gasoline, 79 oct research ... 9.75
- Kerosine ... 10.75
- Gas oil, 48 d.i. minimum ... 10.5

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 ... $2.77-2.97
- North Dakota, 36.0-36.9 ... 2.62-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ... 3.00
  - West Texas, N. M., inter., 36.0-36.9 ... 2.93
  - West Texas, N. M., sour, 32.0-32.9 ... 2.71
  - East Texas, flat ... 3.25
  - Mirando, 28.0-28.9 ... 3.31
- Illinois Basin, flat ... 3.00
- Pennsylvania Grade, Bradford dist., flat ... 4.05
- California, Signal Hill, 21.0-21.9 ... 2.40-2.50†
- North Louisiana-Arkansas, 36.0-36.9 ... 2.77-3.02
- Wyoming, sweet, 36.0-36.9 ... 2.85-2.90
- Wyoming, sour, 32.0-32.9 ... 2.63-2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) ... $2.61
- Leduc-Woodbend (Alta.) ... 2.67
- Redwater (Alta.) ... 2.56
- Daly (Man.) ... 2.38
- Smiley (Sask.) ... 2.33

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido ... $3.51
- San Joaquin, 41.0-41.9, Puerto la Cruz ... 3.25
- Oficina, 35.0-35.9, Puerto la Cruz ... 2.88-2.90
- Tia Juana, Medium, 26.0-26.9, Amuay ... 2.40
- Bachaquero, flat, Las Piedras ... 1.78-1.93
- Tarra, 38.0-38.9, San Lorenzo ... 2.93
- Lagunillas Heavy, flat, Cardon ... 2.10

†*Differential per deg. of grav. varies.*

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura ... $1.89-1.90
- Safaniya, 27.0-27.9, Ras Tanura ... 1.50
- Iran, 34.0-34.9, Bandar Mashur ... 1.86-2.04
- Iran, 34.0-34.9, Abadan ... 1.81
- Iraq, 35.0-35.9, Fao ... 1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi ... 1.67
- Qatar, 41.0-41.9, Umm Said ... 2.05
- Neutral Zone, Burghan, 23.5-24.4, Mina Saud ... 1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud ... 1.38

Middle East, Eastern Mediterranean
- Arabian, 35.0-35.9, Sidon ... $2.29
- Iraqi, 36.0-36.9, Tripoli, Banias ... 2.31

Far East, Cargoes, FOB Lutong, Sarawak
- **Seria Light, flat ... $2.57↓**

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- **U.S. Gulf-New York, clean ... (USMC—35%) $1.85↓**
- **U.S. Gulf-New York, dirty (USMC—42½%) $1.64↓**
- **NWI-USNH, dirty ... (USMC—70%) $0.83↓**
- NWI-UK/Cont., dirty ... (Scale—42½%) 18/8*
- Persian Gulf-UK/Cont., dirty ... (Scale—55%) 28/1*
- Persian Gulf-USNH, dirty ... (USMC—65%) $4.45

**Sterling.*

Sinclair Decentralizes Its Marketing

When a major oil company sees that communication between the home office and field levels is slowing down, what does it do? Sinclair Refining Co. feels that it has the answer—decentralize.

Last week the company completely "realigned" its 36-state marketing area into three regions. According to Thomas B. Kimball, president, this new structure will "streamline" communications.

Sinclair's products sales in 1958 were the highest in the company's history. Sales have been increasing particularly in the Central and Great Lakes Divisions.

Both of these divisions maintain headquarters in Chicago. But their administration has been supervised by a vice-president in New York.

In addition, three other divisions, headquartered in Denver, Kansas City, and Fort Worth, all looked to New York for their authority—all to the same vice-president.

To handle its expanding sales more efficiently, Sinclair has divided responsibility among three regional offices: New York, Chicago, and Kansas City, Mo. Sinclair created one new vice-presidency.

Where there once was one "home office" to supervise marketing in eight divisions, now there are three "home offices." And where there once were two vice-presidents stationed exclusively in New York, now there are three vice-presidents each stationed at one of the regional offices. This is the first time that Sinclair has stationed vice-presidents with line authority away from New York.

In the past, two Sinclair vice-presidents in New York divided between themselves the supervision of the company's eight divisions. Louis W. Leath, who managed the western and the midwestern regions, last month was made a vice-president of Sinclair Refining's parent company, Sinclair Oil Corp. Leo J. Hoar, who formerly managed the eastern region, became director of marketing for the subsidiary (PW—Mar.6'59,p58).

The three new regional vice-presidents are B. P. Mackenzie, E. J. Bassett, and W. D. Cross. The first two executives were raised from division manager to vice-president status.

Mackenzie will be in charge of the eastern region, at New York, and Bassett will be in charge of the western region, at Kansas City, Mo. Cross, already a vice-president, was put in charge of the central region, and will continue to make his headquarters in Chicago. All three regional executives will report to Hoar, the newly appointed director for marketing.

The marketing staff, however, will remain in New York. This layer of executives, which assists in planning and supervising various aspects of marketing, will serve all three regions.

The staff will also retain its customer orientation: In 1957, Sinclair appointed three general managers to supervise distribution to retailers, consumers, and wholesalers, respectively. This customer orientation has a parallel at the division level where each division manager is provided with staff assistants to help with these three customer segments.

Sinclair's eight division managers will have neither more nor less authority than in the past. For this reason, the reorganization should be viewed as a "decentralization of administration" rather than a decentralization of authority, the company says. The "home office" has not delegated any of its authority to the field divisions. It has merely decentralized itself geographically.

What's New / IN MARKETING

Mohawk Refining Corp. says it is ready with several arguments that could win an appeal of the Feb. 12 court decision requiring a "used oil" label on re-refined lubricants. But C. K. Johnes, the company's secretary-treasurer, says that Mohawk hasn't yet decided whether to go through with an "expensive" appeal.

Last month the Third U.S. Circuit Court of Appeals, in Philadelphia, found "no error" in the Federal Trade Commission's ruling that Mohawk had "misled" the public by giving its re-refined motor oils a "new oil" look.

But Johnes says that the court disregarded Mohawk's most important point: that its re-refined oils "are not qualitatively different from new oils."

•

The National Oil Jobbers Council is planning an "all-out" attack against the 27.5% depletion rate and the commercial account policies of major oil companies. According to Otis H. Ellis, NOJC's general counsel, the double-barreled attack is triggered by the resentment of jobbers over the imposition of mandatory oil import controls.

•

A Washington state jobber is suing Standard Oil Co. of California for $1.8-million for discriminating against him. The jobber says Standard granted discounts and other benefits to his competitors that cost him $600,000 in direct damages and lost profits.

If Clyde Perkins of Vancouver, Wash., wins his case, the Robinson-Patman Act will allow him treble damages.

•

Tidewater Oil Co. continues to expand in the East. Last week the company announced the purchase of F. D. Koehler Co., Inc., of Staten Island, N.Y., a Tidewater distributor for more than 45 years.

Tidewater acquired 27 outlets, several commercial accounts, a substantial fuel oil business, and a water terminal, as well as dispensing and other equipment.

•

Service station dealers who have graduated from retailing schools conducted by oil companies sell from 4% to 7% more than other dealers, says Harold T. Cruikshank, Jr., reseller sales division manager at Esso Standard Oil Co. Cruikshank also says that dealers who score high in company training tests also score high in sales.

•

Houston service station dealers held a "mass meeting" last week in a pow-wow against trading stamps. But leading Houston marketers and a stamp company see only smoke and no fire in the uprising. "It's just one of the many that pop up all the time," says a stamp company official.

•

A bill introduced in the California legislature requires the posting of octane ratings on service station pumps throughout the state. The measure was approved by the manufacturing, oil, and mining industries committee of the state assembly.

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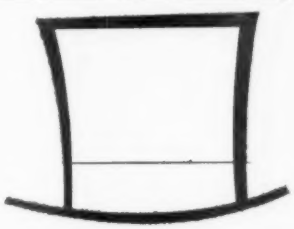

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M. E. Grant

C. R. Younts

CHARLES R. YOUNTS has been elected chairman of Plantation Pipe Line Co., Atlanta, Ga., and **MALCOLM E. GRANT** succeeds him as president. Grant, formerly executive vice-president, was also elected chief executive officer.

HUBBARD S. CAVEN and **A. NELSON MYERS** have been elected vice-presidents of Texas Gulf Sulphur Co., Houston. Caven is headquartered at the company's office in Houston. Prior to joining Texas Gulf in 1947, he was a member of the law firm of Abney & Caven, Marshall, Tex. Myers is manager of sales, and is located at Texas Gulf's New York office.

WYNNE M. ADAMS is the new district geologist in Tidewater Oil Co.'s central division exploration department in Midland, Tex., and **James A. Kurfess** is district geophysicist there. Adams was formerly district geologist in Houston, and Kurfess was a geophysicist in Los Angeles.

ALLAN SHIVERS, former governor of Texas, is a new director of Champlin Oil & Refining Co., Ft. Worth. Shivers is chairman of Western Pipelines, Inc.

E. R. ORWIG became general superintendent of exploration for General Petroleum Corp., in Los Angeles, on Mar. 1. Orwig, with General Petroleum since 1948, was formerly division superintendent. At the same time, **J. N. Terpening** became northern division exploration manager, in Bakersfield, Calif. He joined the company in 1951 as a junior geologist.

WILLIAM E. McKITRICK has been named manager of Shell Oil Co.'s intermountain exploration division, with offices in Salt Lake City. He was formerly a senior staff geologist for Shell at Los Angeles. McKitrick succeeds **Galen H. Sturgeon,** who assumes new duties in Shell's exploration headquarters in Los Angeles.

W. E. McKitrick

P. K. Kuhne

PAUL K. KUHNE, formerly director of refinery technology in Gulf Oil Corp.'s manufacturing department, has been appointed associate director of research for Gulf Research & Development Co. Gulf's refinery technology laboratory at Philadelphia recently became a division of Gulf Research & Development Co., Gulf's research subsidiary, with headquarters at Harmarville, Pa. Kuhne will be headquartered in Harmarville, and **T. L. Cantrell** will continue in Philadelphia as manager of the laboratory there.

W. F. KIESCHNICK has been appointed to the newly created position of assistant to **W. Dow Hamm,** general manager of foreign and domestic exploration for Atlantic Refining Co. Kieschnick was formerly director of the exploitation section of Atlantic's research and development department. **H. F. Dunlap,** formerly director of the research and development exploration section, succeeds Kieschnick, and **S. C. Mut,** formerly supervisor of the research and development surface prospecting group, succeeds Dunlap.

MARION F. BOLTON, manager of operations for Kerr-McGee Oil Industries, Inc., at Shiprock, N.M., has been appointed general manager of operations for Kermac Nuclear Fuels Corp., at Grants, N.M. **Clifford L. Wise,** formerly assistant to Kerr-McGee's vice-president in charge of refining, replaces Bolton as manager of operations at Shiprock.

ROBERT H. VICK is manager of the new engineering department formed by Ambassador Oil Corp., Ft. Worth, to consolidate three previously separate departments. **J. D. Christner** has been named assistant to Vick, and continues as chief primary engineer. **Russell Meyers** is senior petroleum engineer in the new department. Vick was previously chief engineer for secondary recovery, and Meyers was in Ambassador's evaluation and acquisition department in Abilene, Tex.

R. H. Vick

W. A. Greeven

W. A. M. GREEVEN is the new stockholders' representative of Standard Oil Co. (N.J.) for its affiliates in Italy, Austria, and Switzerland. Greeven, formerly Jersey Standard's marketing coordinator in New York, will be headquartered in Rome. He succeeds **Ralph P. Bolton,** who is retiring.

T. A. Clote

M. S. Patton

J. H. Gimlin

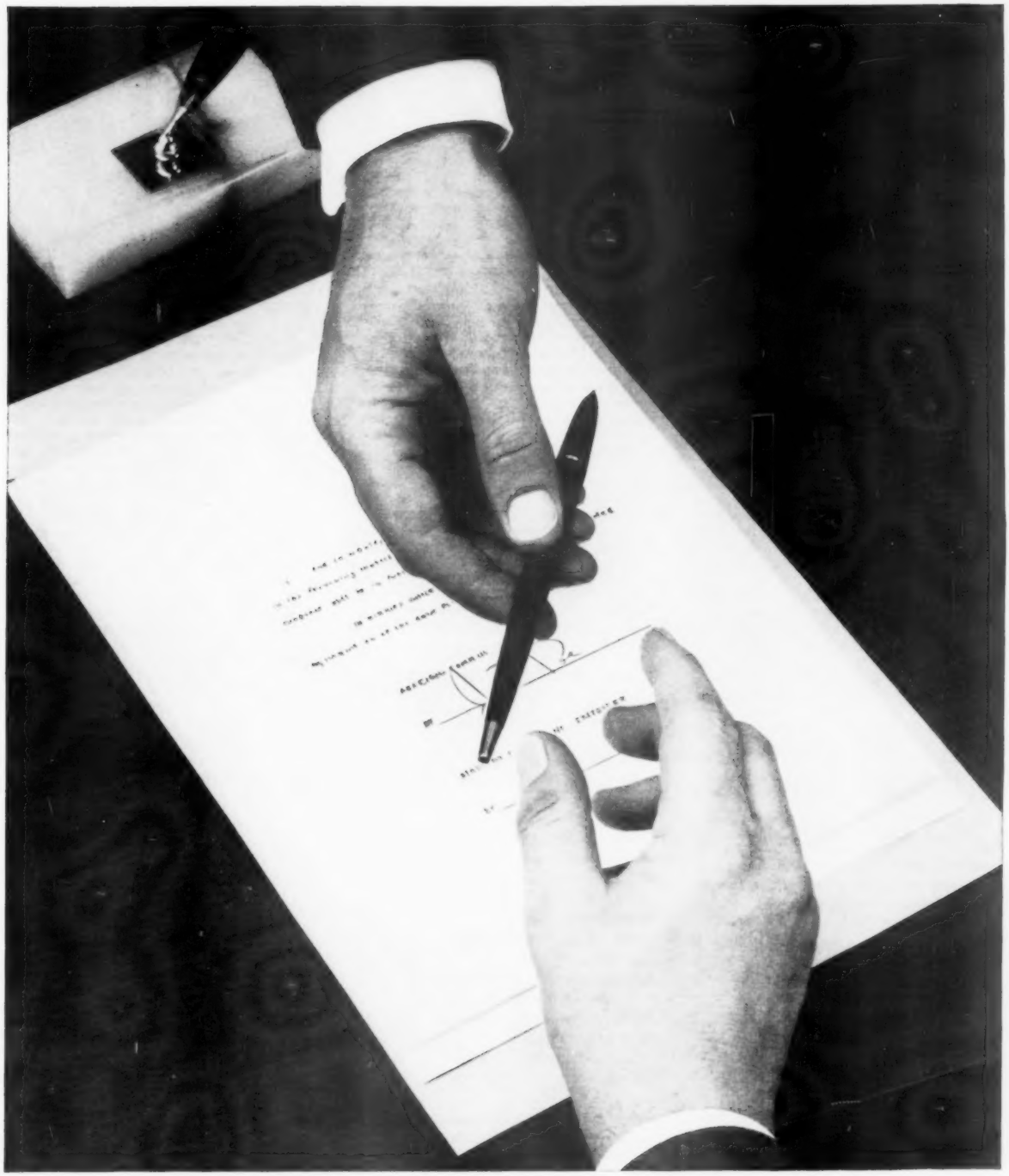
V. L. Smith

F. McDaniel

C. J. Kerwin

K. Martin

SEVEN NEW DIVISION MANAGERS for exploration and production have been appointed by Sunray Mid-Continent Oil Co., in what the company calls its "first major stride toward decentralization." **Thomas A. Clote** has been named exploration manager of the Rocky Mountain division, at Denver. He is presently division geologist at Tulsa. **M. S. Patton, Jr.,** has been named production manager of the Gulf Coast division, at Houston, and **J. H. Gimlin** manager of exploration there. Patton is now manager of the production department's engineering division, and Gimlin is a division landman, both in Tulsa. **V. L. (Fred) Smith** has been named production manager, and **Fred McDaniel** exploration manager, of the Southwest division, at Midland, Tex. Smith is presently district production superintendent at Midland, and McDaniel is assistant superintendent of the oil division in Tulsa. **C. J. Kerwin** has been named manager of production of the Central division, at Oklahoma City, and **Karl Martin** manager of exploration there. Kerwin was formerly superintendent of the production department's oil division in Tulsa. Martin was previously manager of exploration for Sunray Oil Co., Sunray Mid-Continent's Canadian subsidiary, in Calgary. The new managers will assume their responsibilities on July 1, when the new division offices open.



"Respect for contracts is a fundamental element of civilized life. Unless such respect is firmly established as a moral and legal rule, the economic stability and peaceful progress of the entire free world are inevitably hampered."

— M. J. Rathbone, President

Standard Oil Company (New Jersey)

and affiliated companies

ESSO

DEPT/Service & Equipment Companies

GEORGE B. CUSHING has been elected vice-president of National Supply Co., Pittsburgh. Cushing joined the company in 1946 as manager of sales promotion, and was promoted to director of public relations and advertising in 1956. As a vice-president, he will be in charge of personal and public relations, advertising, publicity, and related marketing activities.

G. B. Cushing

D. G. Wiebe

DON G. WIEBE has been appointed manager of Milwhite Mud Sales Co., Ltd., with offices in Calgary. He joined Milwhite in Canada in 1956, and has served as sales manager since that time.

TURNER G. GARWOOD has been named sales representative of Otis Engineering Corp. for Europe, Africa, and the Middle East. He will have offices in Geneva, Switzerland. He was most recently in charge of European export sales in the company's general offices in Dallas. Garwood will handle sales of Otis' subsurface flow controls and wellhead safety equipment. He will also be available for consultation on equipment and wire-line services for high-pressure oil and gas wells.

R. K. FINLEY, assistant vice-president of Seismograph Service Corp., Tulsa, is plant manager of Seiscor Mfg. Co., Tulsa, SSC's newly formed subsidiary. **Clyde V. Hussey,** formerly supervisor of field engineering for SSC, is head of the new company's sales department. **Edward J. Grossland,** SSC research engineer, is in charge of the new product development department. **C. C. Smith,** formerly SSC purchasing agent, and **R. J. Puchaty,** formerly field engineer and applications engineer, are Seiscor sales engineers, working under Hussey. **M. Grady Steil,** formerly outside production coordinator of SSC, becomes purchasing agent for both SSC and Seiscor.

GEORGE B. HANSON is the new vice-president in charge of sales for Liquid Mud, Inc., New Orleans. Hanson will supervise the company's proposed expansion of sales and services, including complete barge facilities and engineering services for marsh drilling in the coastal areas. Hanson was formerly service supervisor of Baroid Division, National Lead Co.

LAWRENCE H. HODGES has been named manager of J. I. Case Co.'s Rockford (Ill.) works. Hodges has been chief product engineer at Rockford since 1955.

F. W. Argue

A. L. Hartridge

FRED W. ARGUE was elected executive vice-president, and **ALFRED L. HARTRIDGE** financial vice-president, of Stone & Webster Engineering Corp. As senior officer of the Boston office, Argue assumes responsibility for executive coordination of activities at that location. He was formerly engineering manager and vice-president. Hartridge, formerly treasurer and vice-president, will be headquartered in New York, where, in addition to his other responsibilities he will coordinate the financial activities of the company's domestic and foreign subsidiaries. **Richard N. Benjamin,** president of Stone & Webster, Inc., was elected a director of Stone & Webster Engineering, and **F. E. Conger** was appointed assistant secretary.

JACK G. HOWE has been appointed plant representative for National Supply Co.'s plant in Houston. He will be responsible for liaison between the plant and the field organization on matters concerning the

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sales of wellhead equipment. Howe started at the Houston plant in 1941. He was most recently engaged in wellhead sales work in National Supply's Corpus Christi district.

NORMAN K. TSCHIRLEY has been named technical sales director of Baroid-Maffei S.p.A., with offices in Milan, Italy. Baroid-Maffei is a new company organized by National Lead Co. to supply drilling mud products to the oil industry in the Mediterranean and Persian Gulf areas. Tschirley was formerly assistant chief drilling mud engineer with Baroid Division of National Lead Co., at Houston.

CARROLL J. GREEN has been promoted from field salesman to district representative for Sperry-Sun Well Surveying Co., at Lafayette, La. Green has been with the company since 1955.

STANLEY S. SCOTT is the new sales representative in the Houston district of Allis-Chalmers Industries Group. Scott joined Allis-Chalmers in 1953, and has been an application engineer in the company's compressor department.

W. A. (Lon) BELCHER, division manager of Alten Foundry & Machine Works, Inc., and **W. L. (Bill) Underwood,** warehouse manager, have moved to new offices in the company's new Oklahoma City warehouse. Belcher and Underwood will serve customers in the Mid-Continent area.

GORDON F. AHALT has been appointed assistant treasurer in the petroleum department of The Chase Manhattan Bank. He joined Chase Manhattan in 1954, after three years as a petroleum engineer with Stanolind Oil & Gas Co., Tulsa.

G. F. Ahalt

R. J. Waugh

R. J. WAUGH has been appointed general manager of Lummus Co. Canada, Ltd., with headquarters in Montreal. Waugh joined Lummus Co., Ltd., in London, as a process engineer in 1951. He moved to Canada in 1956 to take a position with Du Pont Co. of Canada Ltd., and rejoined the Lummus organization in October, 1958.

JOHN G. BELL CO., engineering equipment company in Los Angeles, has been named California representative of Clayton Mark & Co., Evanston, Ill. Bell will distribute Clayton Mark's line of forged steel products, including Petro, Hydro, Handlebar, and Mark unions, check valves, and high-pressure pipe fittings.

G. V. McClintic

G. M. Tope

GEORGE M. TOPE is the new manager of the pipe department of Republic Supply Co., and **GEORGE V. McCLINTIC** is the new manager of the central Oklahoma district. Tope has just returned from a training program in Cleveland with Republic Steel Co., the supply company's parent. Before the training program, he was sales representative in Denver. In his new position, he will be headquartered at the general office in Oklahoma City. McClintic was vice-president of Sabre Drilling Co. before joining Republic Supply as machinery representative in 1958. McClintic's district includes stores at Seminole, Healdton, Cement, Elmore City, and Oklahoma City.

JACK HUDDLE has joined the sales engineering staff of Grove Valve & Regulator Co., at Odessa.

C. H. THURBER, vice-president of Empire Geophysical, Inc., moves from Odessa, Tex., to the Ft. Worth headquarters, where he will be in charge of the company's research and development program. He has been with Empire since 1953, and was largely responsible for development of Empire's VS Acoustic system of oil well logging.

BOB L. CRAIN is in charge of Otis Engineering Corp.'s eastern division office, at Longview, Tex. He will supervise sales and service operations in East Texas, Arkansas, and northern Louisiana. Crain was formerly division manager at the company's Corpus Christi office. He succeeds **D. S. Simon,** who has resigned.

WILLIAM L. GLOVER has been appointed area sales engineer for Larkin of Butler, with offices in Belpre, Ohio. The Belpre office serves Ohio, West Virginia, and eastern Kentucky. Larkin of Butler manufactures oil and gas well production equipment and water well drilling tools. Glover was formerly sales and service engineer for Baker Oil Tools.

ROBERT E. MANNER has joined the marketing department of Geophysical Service Inc., Dallas. In his new position, he will assist in the preparation of petroleum exploration contracts, and will report to **W. C. Edwards Jr.,** head of the contracts administration section of the department.

ROBERT O. ALBERT is manager of the new Santa Barbara (Calif.) Laboratory, opened by Petroleum Technologists, Inc. He was transferred from the Montebello (Calif.) Lab.

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Public Utility Control May Be Next

The now existing threat of federal price control over oil could be the major step toward public utility regulation of the entire petroleum industry.

The situation promises a new era for the industry. There is no longer any question that the industry's operations in the future will be in sharp contrast to the competitive, free-enterprise economy that characterized oil's first 100 years.

There are those in the industry who say that the domestic producers during the past two weeks only swapped price controls imposed by Middle East oil for price controls imposed by the federal government. But the basic issue goes much deeper.

The industry realized no gain by the imposition of mandatory control over imports. In fact, it lost a lot of freedom.

Initial permissible imports will be less than 200,000 b/d less than the average for 1958. If all of this cutback could be translated into an increase in crude output in Texas, it might add 1¼ days to the producing schedule there. So, nationwide, the reduction will bring no significant hike.

President Eisenhower's directive places an important "control valve" in the government's hands. The Administration has assumed the power to open the flow of imports if the domestic oil situation is not to its liking.

In short, the government will decide what the supply—and the price—of oil and refined products should be in the U.S.

From the outset, as Petroleum Week warned repeatedly, it was hard to see how imposition of mandatory import controls could fail to lead to some form of price control. For if the government had not issued a "price policing" directive in the beginning, consumers would have demanded it sooner or later.

The over-all situation for producers is not improved. They are still in the same cost-price squeeze that they've faced for years. There will continue to be a ceiling on oil prices while there is none on steel and labor, just to cite two major cost items.

The situation still does not improve the incentives for oil men to take the unique long-odds risks of drilling for the new oil reserves the nation needs so urgently.

It may well be that the decline in exploratory drilling during the past two years is the start of a trend. And reserves will suffer. For only by sharp pencil calculations did reserves of liquid hydrocarbons rise by 2% last year. The volume of new petroleum liquids reserves found by drilling dropped 22.3% (page 15).

The end result may be that the industry will fall into the hands of the Federal Government by default—by default of those whose actions led it to Washington in the first place.

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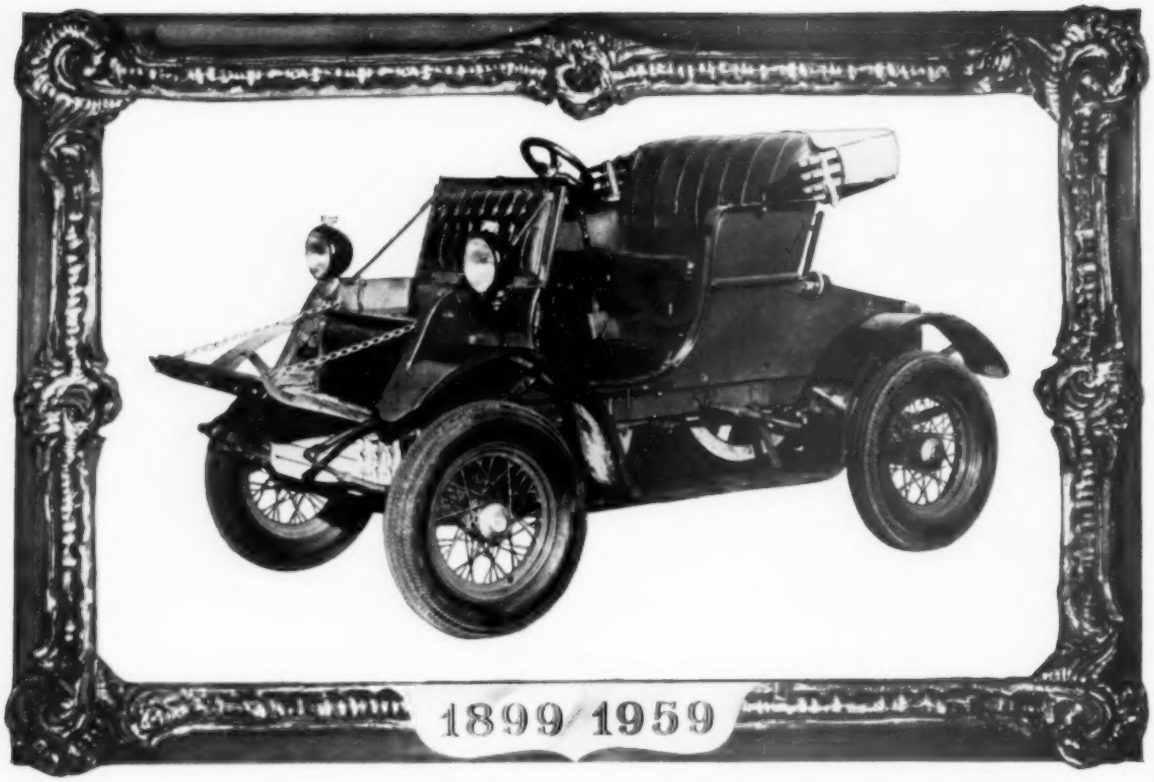

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